MEMORANDUM

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To: Darcy Akers, PE, City of Bellevue

From: Brent Powell, PE, PTOE

Date: October 30, 2023

Re: NE 8th Street Study – Traffic Analysis Memorandum

INTRODUCTION

As part of the City of Bellevue (City) Vision Zero Program, NE 8th Street from 140th Avenue NE to 164th Avenue NE was selected for a safety review after past collisions analysis identified it was on the City's High Injury Network. In 2021, the City conducted a road safety assessment along NE 8th Street and several improvements for considerations were identified along the segment between 156th Avenue NE and 160th Avenue NE. Several of these considerations required further analysis to determine feasibility.

The City hired Perteet to prepare a traffic analysis for reconfiguration and enhancement to NE 8th Street from 156th Avenue NE to 160th Avenue NE. The purpose of this memorandum is to summarize the traffic analysis and provide a recommended design alternative. Figure 1 shows an aerial image of the existing configuration of NE 8th Steet, with study limits outlined in yellow.

Figure 1. Existing Configuration of NE 8th Street from 156th Avenue NE to 160th Avenue NE.

Traffic Data

The City provided existing traffic counts and signal timings for Perteet to utilize for the traffic analysis. The count data was collected on Tuesday, July 25, 2023, during the AM and PM peak hours for each intersection within the study limits of NE 8th Street: 156th Avenue NE, the Crossroads Post Office (ingress) driveway, 158th Avenue NE (signed as "Crossroads Place"), and 160th Avenue NE. Perteet considered the post office ingress as a T-intersection for this study. Perteet considered the intersection of NE 8th Street and 160th Avenue NE as a four-legged intersection, with the northbound and southbound approaches stop-controlled. The northbound approach is the driveway located slightly west of 160th Avenue NE.

The City also provided forecast 2035 traffic volumes at the study intersections during the AM and PM peak hours. From 2023 to 2035, the total traffic volume approaching all study intersections increases by approximately 115% during the AM peak hour and 108% during the PM peak hour. Appendix A shows all volumes Perteet used for this analysis.

The City initiated this traffic study to evaluate solutions that include addressing current safety concerns. To that end, Perteet utilized the City's collision diagram for the study area. This diagram captures collisions occurring within the study limits from 2018 through 2022. Refer to Appendix B for the collision diagram. The City has other collisions documented within the Safe Transportation for Every Pedestrian (STEP) Pedestrian Road Safety Assessment Report (March 25-26, 2021); however, the data is older, ranging from 2016 through 2020.

Part of this traffic analysis includes an evaluation of pedestrian crossings along the corridor at legal crossings and at illegal midblock crossings. Perteet coordinated with the City to obtain video recordings from the 156th Avenue NE and 158th Avenue NE cameras on a weekday, Thursday, August 10, 2023, and on a weekend, Saturday August 12, 2023. Both recordings were full 24-hour samples. Refer to Appendix C for a summary of pedestrian and bicyclist data from the City's traffic cameras.

COLLISION ANALYSIS

Perteet reviewed the crash data provided by the City from 2018 through 2022. There were 22 collisions in total, three resulting in a potential injury and one resulting in a serious injury. Perteet reviewed the collision diagram (Appendix B) for any collisions involving pedestrians or bicyclists, as well as for vehicular patterns. These collisions included:

- One vehicle-pedestrian collision midblock between 156th Avenue NE and the post office ingress. The level of severity for this collision was property damage only.
- One vehicle-bicycle collision at a driveway between 158th Avenue NE and 160th Avenue NE involving an eastbound left-turning vehicle. The level of severity for this collision was disabling injury.
- Four vehicle collisions at the post office ingress, all involving westbound-left-turning vehicles colliding with eastbound-through vehicles.
- Three vehicle collisions at 160th Avenue NE with southbound-left-turning vehicles colliding with westbound-through vehicles.

Observations

The vehicle-pedestrian collision occurred outside of a legal crossing. Increasing the opportunities for pedestrian to cross by adding defined pedestrian routes to crossing NE 8th Street within the study area could potentially reduce crashes[1].

Within the study limits, there are several driveways on the north side of NE 8th Street to access Crossroads Mall in addition to the 156th Avenue NE, 158th Avenue NE, and 160th Avenue NE intersections. On the south side of NE 8th Street, there are 11 driveways to access businesses, including the post office ingress. The businesses closest to

[1] The study *Safety Performance of Midblock Pedestrian Crossing Treatments* (2022) determined a crash modification factor (CMF) of 0.82 for midblock crosswalks. See CMF ID 11181.

156th Avenue NE on the south side have multiple driveways for ingress and egress. The collisions Perteet noted throughout the study limits appear correlated to the high density of driveways. Corridor access management is a proven safety countermeasure by FHWA[2].

Vehicles heading westbound through the 158th Avenue NE intersection wishing to turn left at the post office ingress face a few existing infrastructure challenges, as listed below.

- The first challenge is the relatively short queue distance due to the back-to-back left-turn lane design between this intersection and the 158th Avenue NE intersection.
- The second challenge, specifically for vehicles departing the mall for the post office, is that they need to cross multiple lanes on NE 8th Street to reach the inside turn lane to make a left turn to the post office.
- The third challenge, for all drivers, is the need to cross two lanes of eastbound NE 8th Street traffic to access the post office ingress. When eastbound queues back up at 158th Avenue NE in one or both eastbound lanes on NE 8th Street, visibility for westbound-left drivers may be restricted when looking for a gap to the post office ingress.

At the NE 8th Street and 160th Avenue NE intersection, the existing geometry of this intersection may contribute to collisions. Southbound vehicles approaching the intersection are set back approximately 18 feet when stopped. From this stopped location, motorist sight distance of westbound-through vehicles on NE 8th Street is partially limited by the Crossroads shopping center sign and trees along the 15920 and 15932 NE 8th Street properties. Additionally, westbound-through vehicles transition from one to two lanes within the middle of the intersection. This transition within the intersection leads to less predictable westbound driver movements and may be leading to conflicts with through and turning traffic attempting to access the outside lane that develops at the intersection.

PEDESTRIAN CROSSING SUMMARY AND BICYCLE CONSIDERATIONS

Perteet observed a total of 581 pedestrian crossings, both at legal and illegal locations, throughout the weekday video recording on NE 8th Street between 156th Avenue NE and 158th Avenue NE. The following weekend, Perteet observed 525 pedestrian crossings on NE 8th Street between 156th Avenue NE and 158th Avenue NE. The weekday and weekend pedestrian volumes both had similar splits for time-of-day usage, with approximately 30% of the total pedestrian volume occurring in the AM and the remaining 70% occurring in the PM.

Table 1 shows the amount and travel path of all pedestrian crossings Perteet noted during the weekday and weekend video recordings.

[2] FHWA cites a 25–31% reduction in fatal and injury crashes along urban/suburban arterials based on the 2004 publication *Handbook of Road Safety Measures*. See CMF ID 178 and 179.

Table 1. Pedestrian Crossings across NE 8th Street from 156th Avenue NE to 158th Avenue NE.

Location	Time of Week	Northbound	Southbound
156th Avenue NE (marked crosswalk)	Weekday	200	193
	Weekend	188	185
158th Avenue NE (marked crosswalk)	Weekday	93	89
	Weekend	69	62
Midblock (no crosswalk)	Weekday	3	3
	Weekend	13	8

During the weekend, pedestrians crossed NE 8th Street midblock between 156th Avenue NE and 158th Avenue NE more than during the weekday. The overall number of pedestrians crossing at illegal, midblock locations is significantly lower than the total number of pedestrians utilizing the legal, marked crosswalks.

Perteet observed a total of 34 bicyclists throughout the weekday and 16 bicyclists throughout the weekend video recordings. In total, 82% of bicyclists utilized the sidewalk and the remaining 18% utilized the roadway.

Mobility Implementation Plan Considerations

The City's Mobility Implementation Plan (MIP), adopted in April 2022, highlights existing conditions within the study area that do not meet the following performance targets:

- Pedestrian crossing distance on NE 8th Street from 158th Avenue NE to the nearest midblock crossing between 160th Avenue NE and 164th Avenue NE exceeds the desired arterial crossing spacing of 600 ft. The performance target can be met through installing a midblock crossing to the east of 160th Avenue NE. Perteet completed scoring criteria for the installation of a mid-block crossing at this location, and the total score warrants a midblock crossing. See Appendix H for the scoring criteria.
- Bicycle facilities on NE 8th Street from 158th Avenue NE to 164th Avenue NE do not meet Level of Traffic Stress (LTS) performance targets, which for this corridor is LTS 3. The performance target can be met through installing protected and/or buffered bike lanes.

MODELING RESULTS

The following sub-sections analyze existing conditions and each of the design alternatives one at a time, to discuss the impacts of intersection delays and queue lengths. At the end of the Modeling Results section, Perteet provides a summary and discussion of travel times for each of the design alternatives compared to existing conditions.

Existing Conditions

Perteet modeled the existing signals at NE 8th Street with 156th Avenue NE and 158th Avenue NE and the minor-street stop-controlled intersections of NE 8th Street with the post office ingress and 160th Avenue NE utilizing SimTraffic within Synchro modeling software for the AM and PM peak hours. Table 2 summarizes the results of modeling existing conditions. Refer to Appendix D for SimTraffic reports.

Table 2. Existing (2023) Peak Hour Conditions Vehicle Delay and Intersection LOS.

Intersection	Intersection LOS	Average Control Delay (seconds per vehicle)				
		Overall	Eastbound	Westbound	Northbound	Southbound
AM						
156th Avenue NE/NE 8th Street	B	19.2	20.8	26.1	17.8	13.0
Post Office Ingress/NE 8th Street	A	1.7	1.7	1.7	n/a	n/a
158th Avenue NE/NE 8th Street	B	12.9	9.6	16.0	8.3	12.6
160th Avenue NE/NE 8th Street	A	1.1	1.7	0.5	3.7	2.7
PM						
156th Avenue NE/NE 8th Street	C	28.8	39.6	37.0	19.8	16.2
Post Office Ingress/NE 8th Street	A	3.8	5.7	1.9	n/a	n/a
158th Avenue NE/NE 8th Street	B	16.3	16.2	19.5	13.5	11.7
160th Avenue NE/NE 8th Street	A	3.1	2.9	0.6	6.7	9.7

All existing intersections during the AM and PM peak hours perform at LOS levels at or above LOS C. Both stop-controlled intersections, the post office ingress and 160th Avenue NE, operate with minimal delays during both the AM and PM peak hours, resulting in a LOS A. PM peak hour delays are higher than AM peak hour delays by 2-10 seconds maximum. Overall, all study intersections operate sufficiently during the AM and PM peak hours.

Table 3 summarizes the 95th percentile queues that develop at each approach of the study intersections. "EB" stands for eastbound, "WB" stands for westbound, "NB" stands for northbound, and "SB" stands for southbound. Red-shaded cells represent 95th percentile queue lengths that exceed the available distance to the adjacent intersection. Notably, the eastbound queue at 158th Avenue NE and NE 8th Street during the PM peak hour exceeds the available distance.

Table 3. Existing (2023) Peak Hour Conditions 95th Percentile Queues.

Intersection	EB Available Distance (ft)	EB Queue (ft)	WB Available Distance (ft)	WB Queue (ft)	NB Available Distance (ft)	NB Queue (ft)	SB Available Distance (ft)	SB Queue (ft)
AM								
156th Avenue NE/NE 8th Street	1404	102	417	137	303	144	679	125
Post Office Ingress/NE 8th Street	417	0	162	22	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	108	308	141	246	37	392	54
160th Avenue NE/NE 8th Street	308	27	1,570	16	72	29	274	43
PM								
156th Avenue NE/NE 8th Street	1404	291	417	275	303	179	679	225
Post Office Ingress/NE 8th Street	417	169	162	33	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	212	308	187	246	53	392	102
160th Avenue NE /NE 8th Street	308	13	1,570	8	72	37	274	92

Design Alternatives

Perteet collaborated with the City on four design alternatives to review for reconfiguration of the study area. The focus of the design alternatives is primarily to improve safety and access management; these alternatives are not triggered by a current level of service or queueing deficiency (per existing conditions modeling). Below is a summary of each design alternative and SimTraffic modeling with 2023 traffic counts. Refer to Appendix E for a full-page exhibit of each design alternative and Appendix F for SimTraffic reports.

Option 1: Install a divider curb between the westbound and eastbound directions of travel on NE 8th Street between 156th Avenue NE and 158th Avenue NE. Restrict driveway access in this segment—including at the post office—to right-turn in, right-turn out. Widen the southeast quadrant of the intersection at 156th Avenue NE to allow westbound U-turns and allow southbound-through movements at 158th Avenue NE for post office accessibility. This option will impact right-of-way and potential site reconfiguration of the 76 gas station parcel (located at the southeast corner of 156th Avenue NE and NE 8th Street) due to the U-turn.

Figure 2. Option 1 concept sketch.

Table 4. Option 1 with (2023) Peak Hour Conditions Vehicle Delay and Intersection LOS.

Intersection	Intersection LOS	Average Control Delay (seconds per vehicle)				
		Overall	Eastbound	Westbound	Northbound	Southbound
AM						
156th Avenue NE/NE 8th Street	B	20.0	21.3	27.1	18.6	13.9
Post Office Ingress/NE 8th Street	A	1.6	1.7	1.6	n/a	n/a
158th Avenue NE/NE 8th Street	B	13.9	9.5	16.9	17.0	13.2
160th Avenue NE/NE 8th Street	A	1.1	1.8	0.4	0.0	3.7
PM						
156th Avenue NE/NE 8th Street	C	31.6	44.9	38.4	23.1	18.6
Post Office Ingress/NE 8th Street	A	3.9	6.1	1.4	n/a	n/a
158th Avenue NE/NE 8th Street	B	16.4	16.5	18.9	11.2	13.2
160th Avenue NE/NE 8th Street	B	3.5	3.2	0.6	8.1	10.6

Compared to existing conditions, Option 1 shows lower overall delays at the post office ingress during the AM peak hour. All other study intersections, during both peak hours, experience a small increase in overall delay. The U-turn added at 156th Avenue NE is likely the cause of the increase in delay.

Table 5 summarizes the 95th percentile queue results for Option 1. 95th percentile queues for Option 1 also expand to lengths that surpass the post office ingress for the eastbound approach of 158th Avenue NE and NE 8th Street, at 214 ft during the PM peak hour. However, Option 1 restricts the westbound-left turn into the Post Office ingress, therefore eliminating conflicting movements with the 158th Avenue NE and NE 8th Street eastbound queue.

Table 5. Option 1 (2023) Peak Hour Conditions 95th Percentile Queues.

Intersection	EB Available Distance (ft)	EB Queue (ft)	WB Available Distance (ft)	WB Queue (ft)	NB Available Distance (ft)	NB Queue (ft)	SB Available Distance (ft)	SB Queue (ft)
AM								
156th Avenue NE/NE 8th Street	1404	110	417	155	303	160	679	140
Post Office Ingress/NE 8th Street	417	0	n/a	n/a	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	100	308	151	246	36	392	59
160th Avenue NE/NE 8th Street	308	35	1,570	10	72	21	274	45
PM								
156th Avenue NE/NE 8th Street	1404	293	417	246	303	179	679	263
Post Office Ingress/NE 8th Street	417	193	n/a	n/a	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	214	308	181	246	58	392	112
160th Avenue NE/NE 8th Street	308	14	1,570	11	72	44	274	96

Option 1 increases the number of vehicle lanes pedestrians will need to cross on NE 8th Street due to the addition of the U-turn. But with left-turn restrictions into driveways for vehicles there will be a reduction in left-turn conflicts

with pedestrians at driveways. Overall motorist safety will be improved thorough the limitation of left-turn conflicts at driveways, but pedestrian safety may be decreased from existing conditions due to the U-turn.

Option 1 meets the pedestrian MIP target through the installation of a midblock crossing east of 160th Avenue NE. But Option 1 does not meet bicycle LTS since it does not provide any of the bicycle infrastructure improvements discussed in the Pedestrian Crossing Summary section. Transit will continue to operate in similar conditions to existing, by accessing bus stops on the outer lanes of the corridor.

Option 2: Install a nearly continuous divider curb between the westbound and eastbound directions of travel on NE 8th Street between 156th Avenue NE and 158th Avenue NE. Restrict driveway access in this segment—including at the post office—to right-turn in, right-turn out. The one gap in the curb will be at the Washington Federal Bank parcel. The reason for this exception is because the bank parcel is isolated; it has no secondary access route from any street other than NE 8th Street. Additionally, allow southbound-through and westbound-left access to the post office at 158th Avenue NE and NE 8th Street. Also add a pedestrian crossing along the eastern leg of 158th Avenue NE and NE 8th Street. This option will require coordination with the post office for reconfiguration of the post office parking lot to allow ingress and egress from 158th Avenue NE.

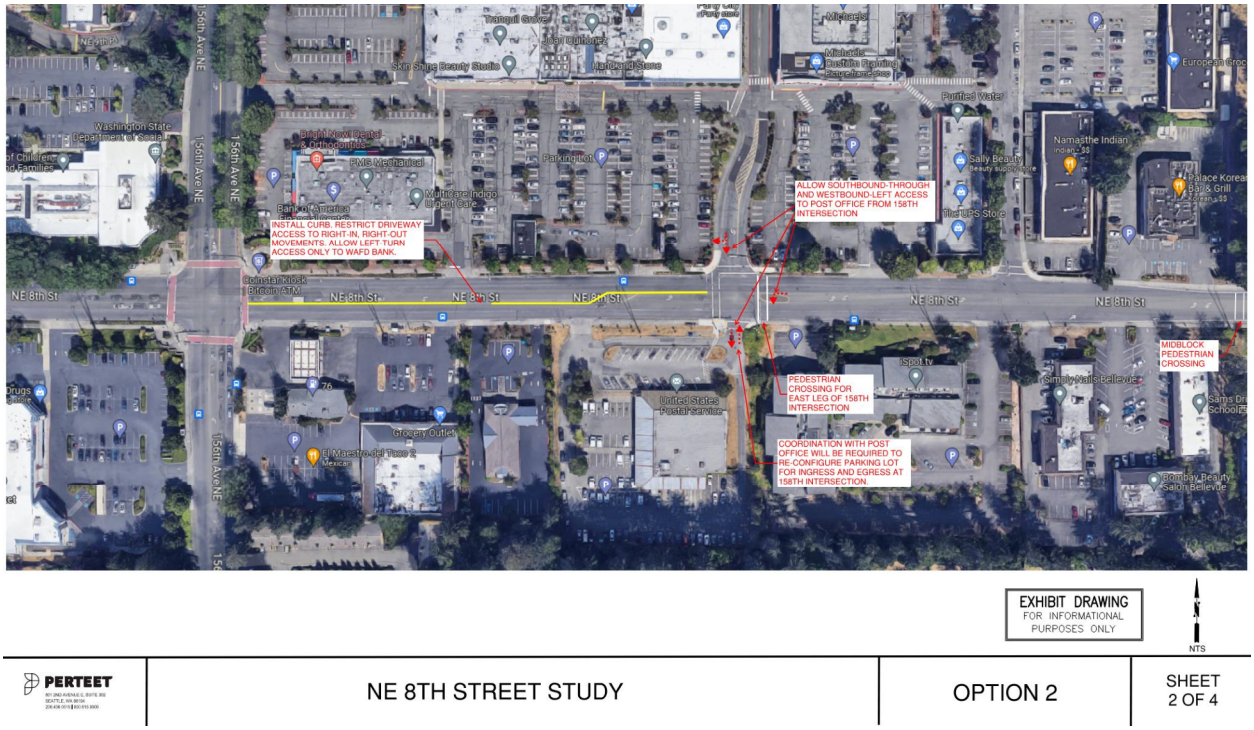


Figure 3. Option 2 concept sketch.

Table 6. Option 2 with (2023) Peak Hour Conditions Vehicle Delay and Intersection LOS.

Intersection	Intersection LOS	Average Control Delay (seconds per vehicle)				
		Overall	Eastbound	Westbound	Northbound	Southbound
AM						
156th Avenue NE/NE 8th Street	B	18.6	19.5	26.3	17.2	12.3
Post Office Ingress/NE 8th Street	A	1.6	1.6	1.6	n/a	n/a
158th Avenue NE/NE 8th Street	B	14.7	10.6	17.9	13.1	14.0
160th Avenue NE/NE 8th Street	A	1.1	1.7	0.5	0.0	3.7
PM						
156th Avenue NE/NE 8th Street	C	30.5	41.9	39.4	23.0	17.9
Post Office Ingress/NE 8th Street	A	3.8	5.9	1.4	n/a	n/a
158th Avenue NE/NE 8th Street	B	16.2	15.8	19.4	14.6	11.6
160th Avenue NE/NE 8th Street	A	3.1	3.0	0.7	8.7	8.8

Option 2 operates similarly to Option 1 with the exception that 156th Avenue NE and NE 8th Street operates with less delay than existing conditions during the AM peak hour. During the PM peak hour, 158th Avenue NE and NE 8th Street operates with less delay than existing conditions.

Table 7 summarizes the 95th percentile queue results for Option 2. 95th percentile queues backup past the post office ingress for the eastbound approach of 158th Avenue NE and NE 8th Street like Option 1, at 217 feet, however Option 2 also restricts the westbound-left turn into the post office ingress, eliminating a safety risk associated with the queueing. Option 2 does allow westbound-left turns at WaFd Bank; however, this turn movement occurs 320 feet west of the 158th Avenue NE intersection and would not overlap with the 95th percentile eastbound queue at 158th Avenue NE.

Table 7. Option 2 (2023) Peak Hour Conditions 95th Percentile Queues.

Intersection	EB Available Distance (ft)	EB Queue (ft)	WB Available Distance (ft)	WB Queue (ft)	NB Available Distance (ft)	NB Queue (ft)	SB Available Distance (ft)	SB Queue (ft)
AM								
156th Avenue NE/NE 8th Street	1404	103	417	167	303	145	679	122
Post Office Ingress/NE 8th Street	417	8	162	14	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	140	308	155	246	40	392	52
160th Avenue NE/NE 8th Street	308	28	1,570	11	72	22	274	48
PM								
156th Avenue NE/NE 8th Street	1404	229	417	275	303	183	679	261
Post Office Ingress/NE 8th Street	417	179	162	7	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	217	308	175	246	53	392	105
160th Avenue NE/NE 8th Street	308	7	1,570	11	72	40	274	75

Option 2 retains the existing amount of vehicle lanes pedestrians will need to cross on NE 8th Street. Similar to Option 1, with left-turn restrictions into driveways for vehicles there will be a reduction in left-turn conflicts with pedestrians at driveways. Overall, both motorist and pedestrian safety will be improved.

Bicyclists and transit will experience similar impacts as discussed for Option 1. Similar to Option 1, Option 2 meets the pedestrian MIP target through the installation of a midblock crossing east of 160th Avenue NE. Option 2 also does not meet bicycle LTS.

Option 3: Road reconfiguration along NE 8th Street with one lane per direction in addition to a two-way left-turn lane. Add buffered bike lanes in each direction within existing curb lines now that additional roadway width is available from the road reconfiguration. At the 160th Avenue NE and NE 8th Street intersections, the Option 3 SimTraffic model allows one storage vehicle in the NE 8th Street two-way left-turn lane upon making a southbound-left or northbound-left turn from the intersection.

Figure 4. Option 3 concept sketch.

Table 8. Option 3 with (2023) Peak Hour Conditions Vehicle Delay and Intersection LOS.

Intersection	Intersection LOS	Average Control Delay (seconds per vehicle)				
		Overall	Eastbound	Westbound	Northbound	Southbound
AM						
156th Avenue NE/NE 8th Street	C	21.2	23.3	32.3	19.1	11.4
Post Office Ingress/NE 8th Street	A	2.5	2.4	2.5	n/a	n/a
158th Avenue NE/NE 8th Street	B	17.3	11.5	22.6	13.0	13.0
160th Avenue NE/NE 8th Street	A	1.5	2.5	0.6	0.0	3.2
PM						
156th Avenue NE/NE 8th Street	D	42.2	55.7	67.6	28.5	21.8
Post Office Ingress/NE 8th Street	B	13.1	13.8	12.1	n/a	n/a
158th Avenue NE/NE 8th Street	C	31.4	19.0	58.4	31.2	18.1
160th Avenue NE/NE 8th Street	D	18.5	3.7	15.3	34.0	28.3

Overall, lane reduction in Option 3 increases delays at each study intersection during both peak hours excluding the post office ingress and 160th Avenue NE intersections during the AM peak hour.

Table 9 summarizes the 95th percentile queue results for Option 3. During the PM peak hour, the 95th percentile queue that develops at the westbound approach of 156th Avenue NE and NE 8th Street (477 feet), the post office ingress and NE 8th Street (219 feet), and 158th Avenue NE and NE 8th Street (373 feet) all exceed the available westbound distances. (Because this option includes only a single westbound lane, these queues are all connected and are linked directly to the capacity deficiency this option generates at the downstream 156th Avenue NE intersection.) Also during the PM peak hour, the 95th percentile queues expand to a length that surpasses the post office ingress for the eastbound approach of 158th Avenue NE and NE 8th Street, at 204 feet.

Table 9. Option 3 (2023) Peak Hour Conditions 95th Percentile Queues.

Intersection	EB Available Distance (ft)	EB Queue (ft)	WB Available Distance (ft)	WB Queue (ft)	NB Available Distance (ft)	NB Queue (ft)	SB Available Distance (ft)	SB Queue (ft)
AM								
156th Avenue NE/NE 8th Street	1404	98	417	269	303	155	679	109
Post Office Ingress/NE 8th Street	417	0	162	84	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	126	308	248	246	47	392	48
160th Avenue NE/NE 8th Street	308	69	1,570	8	72	21	274	39
PM								
156th Avenue NE/NE 8th Street	1404	365	417	477	303	211	679	278
Post Office Ingress/NE 8th Street	417	370	162	219	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	204	308	373	246	82	392	150
160th Avenue NE/NE 8th Street	308	162	1,570	182	72	68	274	282

With Option 3, pedestrians and bicyclists will experience improved comfort through the buffered bike lanes and additional separation from sidewalk to travel lanes. Pedestrians will also experience improved safety through fewer vehicle travel lanes to cross on NE 8th Street. The proposed two-way left-turn lane in Option 3 provides space for vehicles to wait prior to turning, and the road reconfiguration may encourage vehicles to reduce speeds. Overall, Option 3 provides improved safety for pedestrians, bicyclists, and motorists.

Similar to Option 1 and 2, Option 3 meets the pedestrian MIP target through the installation of a midblock crossing east of 160th Avenue NE. As discussed in the Pedestrian Crossing Summary section, bicycle LTS is met for this option since there is a buffer between bike lanes and travel lanes. Without outer lanes for transit stops, queues may develop behind stopped buses and impact speeds throughout the corridor. Perteet's traffic model did not incorporate this potential transit impact.

Option 4: Install a single-lane roundabout at 158th Avenue NE and NE 8th Street and close the existing post office ingress. Allow ingress access to the post office at 158th Avenue NE and NE 8th Street. This option will require coordination with the post office for reconfiguration of the post office parking lot to allow ingress and egress from 158th Avenue NE. Additional right-of-way may be required at all corners of 158th Avenue NE and NE 8th Street to install the single-lane roundabout.

Figure 5. Option 4 concept sketch.

Table 10. Option 4 with (2023) Peak Hour Conditions Vehicle Delay and Intersection LOS.

Intersection	Intersection LOS	Average Control Delay (seconds per vehicle)				
		Overall	Eastbound	Westbound	Northbound	Southbound
AM						
156th Avenue NE/NE 8th Street	C	18.7	22.3	24.2	16.8	12.6
Post Office Ingress/NE 8th Street	n/a	n/a	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	A	5.0	6.1	4.4	3.8	4.1
160th Avenue NE/NE 8th Street	A	1.3	1.8	0.7	2.0	4.4
PM						
156th Avenue NE/NE 8th Street	D	35.6	49.6	45.5	26.0	20.2
Post Office Ingress/NE 8th Street	n/a	n/a	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	B	12.6	18.4	9.8	4.8	6.6
160th Avenue NE/NE 8th Street	B	4.3	3.9	0.9	12.3	13.3

Option 4 exhibits overall lower delays in the AM peak hour than existing conditions, but slightly higher delays in the PM peak hour, excluding 158th Avenue NE and NE 8th Street. If the City wishes to further study this option, Perteet recommends using Sidra modeling software for future roundabout operations modeling. As discussed in the Pedestrian Crossing Summary section, pedestrians frequently cross the NE 8th Street corridor at marked crossings and illegal, midblock locations. If the City proceeds with Sidra modeling of the 158th Avenue NE roundabout, operations will likely show higher delays than what is shown in Table 10 due to pedestrian volumes.

Table 11 summarizes the 95th percentile queue results for Option 4. With the removal of the post office ingress, Option 4 95th percentile queues, during both the AM and PM peak hours, do not extend to adjacent intersections.

Table 11. Option 4 (2023) Peak Hour Conditions 95th Percentile Queues.

Intersection	EB Available Distance (ft)	EB Queue (ft)	WB Available Distance (ft)	WB Queue (ft)	NB Available Distance (ft)	NB Queue (ft)	SB Available Distance (ft)	SB Queue (ft)
AM								
156th Avenue NE/NE 8th Street	1404	101	607	153	303	140	679	109
158th Avenue NE/NE 8th Street	607	59	308	65	246	25	392	29
160th Avenue NE/NE 8th Street	308	46	1,570	19	72	21	274	49
PM								
156th Avenue NE/NE 8th Street	1404	306	607	347	303	210	679	242
158th Avenue NE/NE 8th Street	607	327	308	189	246	45	392	87
160th Avenue NE/NE 8th Street	308	81	1,570	29	72	50	274	94

At 158th Avenue NE and NE 8th Street, pedestrians will have fewer vehicle lanes to cross on NE 8th Street, improving safety at this intersection. Pedestrians will not experience improved safety at other locations in the study area, though, since most existing conditions will be preserved. Motorists will experience the largest safety improvements at 158th Avenue NE and NE 8th Street with the installation of the roundabout, due to the reduction in the number of conflict points for vehicles and the anticipated severity of crashes.

Bicyclists and transit will experience similar conditions to existing, although the design of the roundabout must accommodate both modes. Similar to Options 1, 2, and 3, Option 4 meets the pedestrian MIP target through the installation of a midblock crossing east of 160th Avenue NE. Option 4 also still does not meet bicycle LTS.

Travel Times

Table 12 provides a summary of 2023 travel times throughout the study area for the eastbound and westbound direction and travel time impacts for each of the design alternatives. Refer to Appendix D and F for SimTraffic travel time results.

Table 12. Summary of SimTraffic Travel Times (2023).

Scenario	Eastbound AM (sec)	Eastbound PM (sec)	Westbound AM (sec)	Westbound PM (sec)
Existing Conditions	86.4	109.1	74.2	84.8
Option 1	88.4 (102%)	113.1 (104%)	76.3 (103%)	82.5 (97%)
Option 2	88.0 (102%)	111.3 (102%)	75.0 (101%)	88.4 (104%)
Option 3	91.0 (105%)	135.8 (125%)	87.5 (118%)	196.1 (231%)
Option 4	85.2 (97%)	122.4 (112%)	57.0 (77%)	74.4 (88%)

Options 1 and 2 exhibit travel times similar to existing conditions for the eastbound and westbound directions during both peak hours. Option 4 shows an increase in travel time in the eastbound direction during the PM peak hour, but a reduction in travel time in the eastbound direction during the AM peak hour and in the westbound direction during both peak hours. Option 3 shows the highest increase in travel times during the PM peak hour, with an increase of 125% from existing conditions in the eastbound direction and an increase in travel time of 231% from existing conditions in the westbound direction. Option 3's travel times align with the intersection delay increases identified in Table 8. Implementing a road reconfiguration has several safety benefits[3] but also introduces overall slower travel times throughout the corridor.

RECOMMENDATIONS

Perteet and the City met on September 22, 2023, to discuss the design alternatives and to review the recommended alternative for the reconfiguration of NE 8th Street from 156th Avenue NE to 160th Avenue NE. After looking at safety and access management for all the design alternatives, the preferred design alternative should improve the safety and comfort of non-motorized roadway users while also meeting MIP targets. Since the

[3] A traditional road reconfiguration converts a four-lane undivided roadway to a three-lane configuration with a center turn lane and, often, bicycle lanes. The CMF for that action is 0.71 per CMF ID 199. However, NE 8th Street is currently a five-lane corridor and already includes a center turn lane. Perteet did not find any published CMF for the specific lane conversion proposed in Option 3. Related research includes FHWA citations of up to 49% reduction in total crashes on urban four-lane undivided collectors and local roads due to the addition of a bicycle lane (CMF ID 10742) and that separated bicycle lanes with flexible posts can reduce bicycle/vehicle crashes by up to 53% compared to traditional bicycle lanes (CMF ID 11296).

study area is not part of a frequent transit network, targets for transit are not a factor considered in the matrix below.

Table 13 provides a summary matrix of the impacts each design alternative would have on the corridor. The green " ✔ " symbol acknowledges that the design alternative includes safety improvements and/or meets the MIP target. The red " ✘ " symbol acknowledges the opposite, that the design alternative does not includes safety improvements and/or does not meet the MIP target.

Table 13. Summary of Design Alternatives Improvements and MIP Targets.

Design Alternative	Driver Safety	Pedestrian Safety	Pedestrian MIP Target	Bicyclist MIP Target
Existing Conditions	✘	✘	✘	✘
Option 1	✔	✘	✔	✘
Option 2	✔	✔	✔	✘
Option 3	✔	✔	✔	✔
Option 4	✔	✔	✔	✘

Option 3 ultimately meets the City's goals of improving safety and meeting LTS goals throughout the study area. Perteet and the City discussed a few revisions to Option 3 to further improve the design alternative:

- Due to the high delay and queues that develop at 156th Avenue NE, preserve two westbound travel lanes from 158th Avenue NE to 156th Avenue NE.
- Only as part of a long-term capital project, allow southbound-through, westbound-left, and eastbound-right access to the post office at 158th Avenue NE and NE 8th Street. Also at this time add a pedestrian crossing along the eastern leg of 158th Avenue NE and NE 8th Street. Similar to the other design alternatives that revised 158th Avenue NE to allow access to the post office, coordination with the post office will be needed to reconfigure the post office parking lot. (This intersection change is only a long-term strategy due to the anticipated cost and complexity of modifying the intersection's traffic signal system and the post office circulation.)
- Consider closing one driveway on the north side of NE 8th Street and two driveways on the south side of NE 8th Street between 156th Avenue NE and 158th Avenue NE to reduce the high density of driveways. Also consider closing the driveway on the north side of NE 8th Street between 158th Avenue NE and 160th Avenue NE.
- Consider narrowing travel lanes east of 160th Avenue NE to establish bike lanes on each side of NE 8th Street.
- Evaluate speed limit based on the proposed changes to this corridor.

Perteet modeled the revised Option 3 design alternative with projected 2035 traffic volumes for the AM and PM peak hours. Table 14 provides a summary of the results. Refer to Appendix G for SimTraffic Reports. This modeling effort anticipates completion of the long-term capital project by 2035 and, therefore, incorporates the changes described above at the 158th Avenue NE intersection.

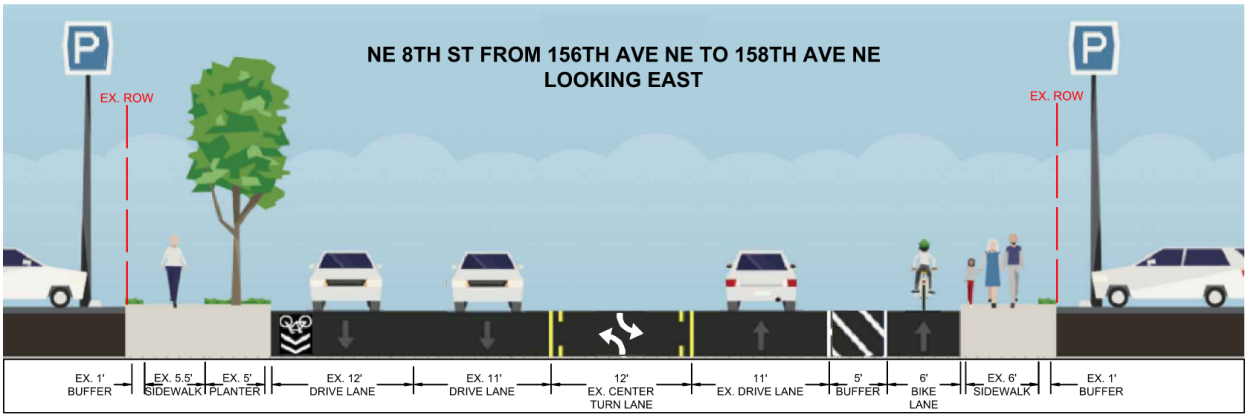


Figure 6. Near-term concept cross section, 156th Avenue NE to 158th Avenue NE.

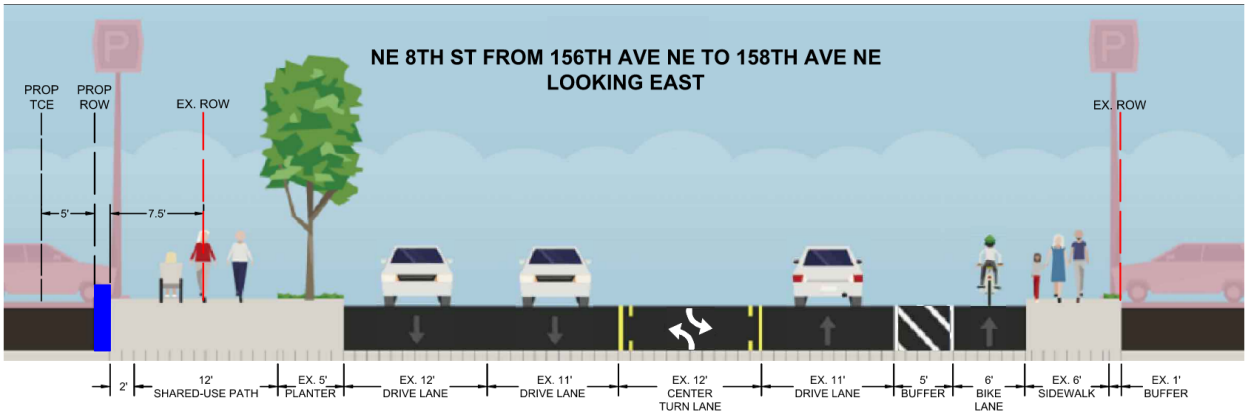


Figure 7. Long-term concept cross section, 156th Avenue NE to 158th Avenue NE.

Table 14. Revised Option 3 with Future (2035) Peak Hour Conditions Vehicle Delay and Intersection LOS.

Intersection	Intersection LOS	Average Control Delay (seconds per vehicle)				
		Overall	Eastbound	Westbound	Northbound	Southbound
AM						
156th Avenue NE/NE 8th Street	C	20.6	22.6	28.4	18.8	12.1
Post Office Ingress/NE 8th Street	A	1.7	2.4	1.2	n/a	n/a
158th Avenue NE/NE 8th Street	B	12.2	7.8	14.9	12.4	15.8
160th Avenue NE/NE 8th Street	A	1.5	2.2	0.7	3.2	7.4
PM						
156th Avenue NE/NE 8th Street	D	36.9	55.5	42.9	28.2	22.2
Post Office Ingress/NE 8th Street	A	4.9	7.9	1.3	n/a	n/a
158th Avenue NE/NE 8th Street	B	17.5	14.7	22.9	16.1	14.7
160th Avenue NE/NE 8th Street	C	4.9	3.3	1.2	8.2	19.0

During the AM peak hour, all study intersections exhibit delays less than existing conditions. During the PM peak hour, the reduction in travel lanes leads to higher intersection overall delays at 156th Avenue NE and NE 8th Street and at 160th Avenue NE and NE 8th Street. At the former, the eastbound direction delays rise by around

25% compared to the 2023 existing conditions modeling. Overall, the delay increases appear to be reasonable considering the anticipated traffic volume growth of around 15% projected for the study area by 2035. The gap in the percentages does indicate that the Revised Option 3 will slightly decrease vehicle throughput at the 156th Avenue NE intersection, but this provides the tradeoff of improved vehicle safety, pedestrian safety, and bicycle accommodation.

With the sufficient operations shown in Table 14 with 2035 volumes during both peak hours, Perteet projects that the revised Option 3 will also operate with sufficient operations with 2023 volumes during both peak hours.

Table 15 summarizes the 95th percentile queue results for the revised Option 3. During the PM peak hour, the 95th percentile queue that develops at the eastbound approach of 158th Avenue NE and NE 8th Street (199 feet) exceeds the distance from the post office ingress to 158th Avenue NE (162 feet). The average queue (153 feet, see Appendix G) will not exceed this distance. With more access points added at NE 158th Avenue NE through the westbound-left, southbound-through, and eastbound-right movements, vehicles may use the westbound-left access point at the post office ingress less, which will also reduce the amount of conflict opportunities with the 158th Avenue NE eastbound approach queue.

Table 15. Revised Option 3 with Future (2035) Peak Hour Conditions 95th Percentile Queues.

Intersection	EB Available Distance (ft)	EB Queue (ft)	WB Available Distance (ft)	WB Queue (ft)	NB Available Distance (ft)	NB Queue (ft)	SB Available Distance (ft)	SB Queue (ft)
AM								
156th Avenue NE/NE 8th Street	1404	104	417	185	303	188	679	107
Post Office Ingress/NE 8th Street	417	8	162	17	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	139	308	259	246	41	392	57
160th Avenue NE/NE 8th Street	308	59	1,570	14	72	29	274	34
PM								
156th Avenue NE/NE 8th Street	1404	331	417	297	303	231	679	288
Post Office Ingress/NE 8th Street	417	243	162	36	n/a	n/a	n/a	n/a
158th Avenue NE/NE 8th Street	162	199	308	302	246	58	392	121
160th Avenue NE/NE 8th Street	308	124	1,570	25	72	36	274	119

The impacts for pedestrians, bicyclists, and transit as described for Option 3 are also applicable to the revised Option 3.

Table 16 summarizes travel times for the revised Option 3 (2035) compared to existing conditions (2023). Even with an increase of volumes in 2035 from 2023, the revised Option 3 exhibits similar travel times to existing conditions during the AM and PM peak hours in the westbound direction, as well as during the AM peak hour in the eastbound direction. The volume increase in 2035 does, however, increase travel times in the eastbound direction during the PM peak hour by 122%. As shown in Appendix G, 156th Avenue NE and NE 8th Street is the only study intersection exhibiting high increases in travel times from existing conditions. Ultimately, 156th Avenue NE and NE 8th Street will serve as a metering intersection for the NE 8th Street study area, limiting eastbound throughput. The City also has the option to adjust signal timings at this study intersection and adjacent study intersections to modify anticipated 2035 travel times.

Table 16. Summary of SimTraffic Travel Times.

	Eastbound AM (sec)	Eastbound PM (sec)	Westbound AM (sec)	Westbound PM (sec)
Existing Conditions (2023 Volumes)	86.4	109.1	74.2	84.8
Revised Option 3 (2035 Volumes)	86.5 (100%)	133.1 (122%)	73.1 (99%)	89.3 (105%)
Average Travel Speeds (2035 Volumes)	20 mph	14 mph	17 mph	13 mph

The MIP travel time target for NE 8th Street in the Crossroads area (speed limit 30 mph) is 9 mph. The revised configuration for Option 3 results in travel speeds all exceeding this target. It is also assumed that the revised Option 3 would result in less delay using 2023 volumes because 2035 volumes are higher. Therefore, revised Option 3 was not separately modeled using 2023 volumes. Overall, Perteet concludes the revised Option 3 has an acceptable amount of increase in travel times when considering the benefits to safety and MIP targets.

Near- and Long-Term Project Elements

Some elements of the revised Option 3 design alternative can be constructed as near term or long-term projects. These near-term elements, that are less costly and quicker to build, may include:

- Re-channelization of the corridor to reflect a road reconfiguration, preserving the two westbound travel lanes from 158th Avenue NE to 156th Avenue NE. Also reduce travel lane widths east of 160th Avenue NE to establish bike lanes on each side of NE 8th Street.
- Cone off driveways to analyze impacts of driveways closures before permanently closing driveways.
- Transition westbound bicyclists from the buffered bike lane at 158th Avenue NE to sharing travel lanes with vehicles. Install sharrow symbols from 158th Avenue NE to 156th Avenue NE.
- Evaluate speed limit based on the proposed changes of this corridor.
- Add midblock crossing with RRFB east of 160th Avenue NE.

Long-term elements of the revised Option 3 design alternative, that are higher in cost and take a longer period to construct, may include:

- Allow southbound-through, westbound-left, and eastbound-right access to the post office at 158th Avenue NE. Reconfigure post office parking lot. Add crosswalk at the east leg of 158th Avenue NE and NE 8th Street.
- Permanently close driveways.
- Construct a shared-use path on the north side of NE 8th Street between 158th Avenue NE and 156th Avenue NE so bicyclists remain separated from vehicles.

Next Steps for Study

With consensus on the recommended design alternative, Perteet will prepare concept layouts and 10%-level opinion of costs for the near term and long-term elements of the revised Option 3.

APPENDICES

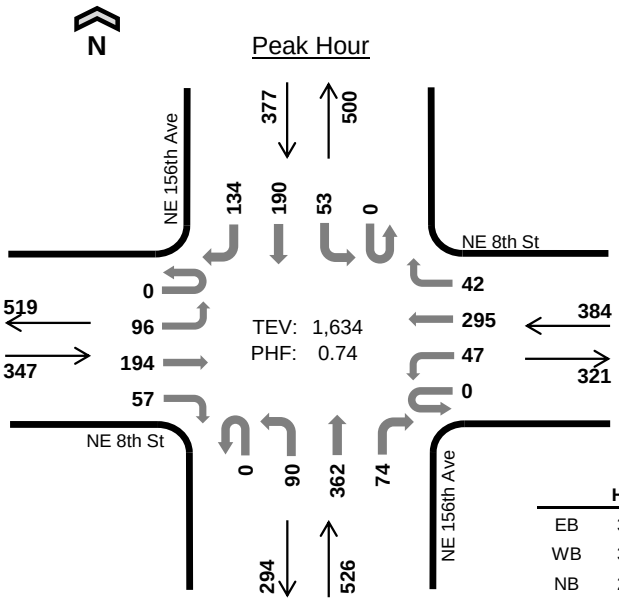
Appendix A Traffic Counts
Appendix B Collision Diagram
Appendix C Pedestrian/Bicyclist Data from COB Traffic Cameras
Appendix D Existing Conditions 2023 SimTraffic Modeling Reports
Appendix E Design Alternative Exhibits
Appendix F Design Alternative 2023 SimTraffic Modeling Reports
Appendix G Recommended Design Alternative 2035 SimTraffic Modeling Reports
Appendix H Crosswalk Criteria

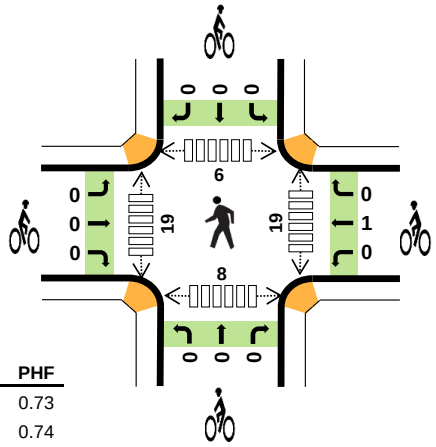
APPENDIX A

Traffic Counts

NE 156th Ave
NE 8th St

Date: 07/25/2023
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	3.5%	0.73
WB	3.9%	0.74
NB	2.1%	0.73
SB	5.6%	0.79
TOTAL	3.6%	0.74

Two-Hour Count Summaries

Interval Start		NE 8th St Eastbound				NE 8th St Westbound				NE 156th Ave Northbound				NE 156th Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	19	20	3	0	9	35	11	0	15	33	8	0	6	25	23	207	0
7:15 AM		0	20	24	4	0	5	47	8	0	11	45	10	0	9	33	26	242	0
7:30 AM		0	22	34	7	0	13	58	18	0	12	48	16	0	19	38	38	323	0
7:45 AM		0	23	38	9	0	11	50	9	0	17	67	14	0	8	42	48	336	1,108
8:00 AM		**0**	**20**	**28**	**6**	**0**	**8**	**58**	**12**	**0**	**15**	**60**	**14**	**0**	**12**	**40**	**24**	**297**	1,198
8:15 AM		**0**	**25**	**57**	**15**	**0**	**11**	**86**	**6**	**0**	**22**	**82**	**9**	**0**	**8**	**40**	**32**	**393**	1,349
8:30 AM		**0**	**24**	**41**	**12**	**0**	**13**	**52**	**8**	**0**	**19**	**105**	**19**	**0**	**19**	**46**	**36**	**394**	1,420
8:45 AM		**0**	**27**	**68**	**24**	**0**	**15**	**99**	**16**	**0**	**34**	**115**	**32**	**0**	**14**	**64**	**42**	**550**	**1,634**
Count Total		0	180	310	80	0	85	485	88	0	145	555	122	0	95	328	269	2,742	0
Peak Hour	**All**	**0**	**96**	**194**	**57**	**0**	**47**	**295**	**42**	**0**	**90**	**362**	**74**	**0**	**53**	**190**	**134**	**1,634**	**0**
	HV	**0**	**6**	**5**	**1**	**0**	**3**	**12**	**0**	**0**	**0**	**7**	**4**	**0**	**0**	**11**	**10**	**59**	**0**
	HV%	**-**	**6%**	**3%**	**2%**	**-**	**6%**	**4%**	**0%**	**-**	**0%**	**2%**	**5%**	**-**	**0%**	**6%**	**7%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	5	6	3	2	*16*	0	0	0	0	*0*	1	2	0	1	*4*
7:15 AM	3	6	2	6	*17*	0	0	1	0	*1*	5	3	3	0	*11*
7:30 AM	6	7	5	5	*23*	0	0	0	0	*0*	2	6	4	1	*13*
7:45 AM	4	3	5	2	*14*	0	0	0	0	*0*	1	4	0	1	*6*
8:00 AM	**4**	**4**	**2**	**5**	***15***	**0**	**0**	**0**	**0**	***0***	**3**	**6**	**0**	**0**	*9*
8:15 AM	**4**	**3**	**1**	**6**	***14***	**0**	**0**	**0**	**0**	***0***	**6**	**4**	**3**	**3**	*16*
8:30 AM	**3**	**7**	**5**	**4**	***19***	**0**	**0**	**0**	**0**	***0***	**3**	**5**	**2**	**3**	*13*
8:45 AM	**1**	**1**	**3**	**6**	***11***	**0**	**1**	**0**	**0**	***1***	**7**	**4**	**1**	**2**	***14***
Count Total	30	37	26	36	*129*	0	1	1	0	*2*	28	34	13	11	*86*
Peak Hour	**12**	**15**	**11**	**21**	***59***	**0**	**1**	**0**	**0**	***1***	**19**	**19**	**6**	**8**	***52***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 8th St				NE 8th St				NE 156th Ave				NE 156th Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	3	2	0	0	1	3	2	0	1	1	1	0	1	0	1	16	0
7:15 AM	0	2	1	0	0	0	5	1	0	1	1	0	0	0	2	4	17	0
7:30 AM	0	2	4	0	0	1	5	1	0	1	2	2	0	2	2	1	23	0
7:45 AM	0	1	3	0	0	1	2	0	0	0	3	2	0	0	1	1	14	70
8:00 AM	**0**	**2**	**2**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**2**	**3**	**15**	69
8:15 AM	**0**	**1**	**2**	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**3**	**14**	66
8:30 AM	**0**	**2**	**1**	**0**	**0**	**1**	**6**	**0**	**0**	**0**	**3**	**2**	**0**	**0**	**2**	**2**	**19**	62
8:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**4**	**2**	**11**	**59**
Count Total	0	14	15	1	0	6	27	4	0	3	14	9	0	3	16	17	129	0
Peak Hour	**0**	**6**	**5**	**1**	**0**	**3**	**12**	**0**	**0**	**0**	**7**	**4**	**0**	**0**	**11**	**10**	**59**	**0**

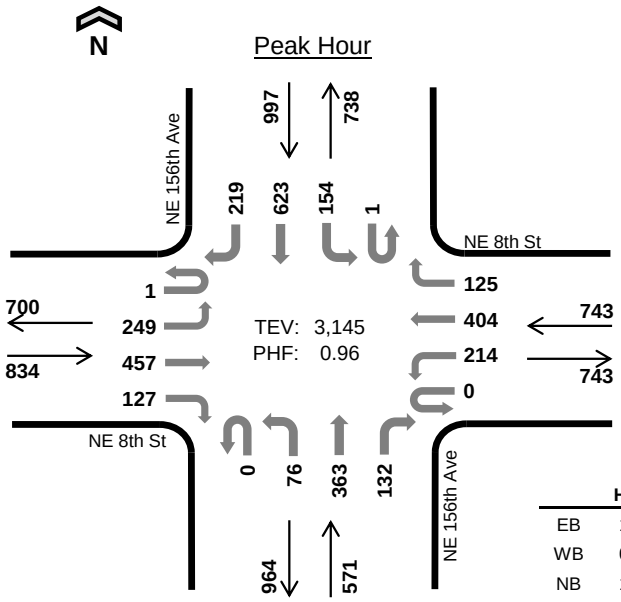
Two-Hour Count Summaries - Bikes

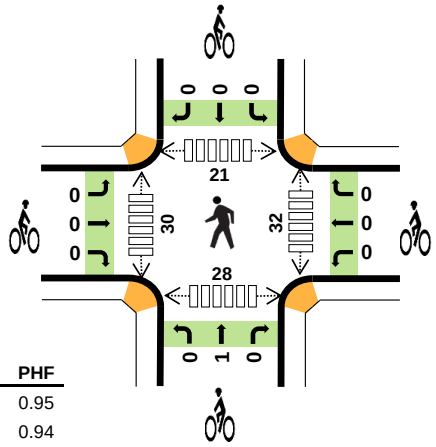
Interval Start	NE 8th St			NE 8th St			NE 156th Ave			NE 156th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:45 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
Count Total	0	0	0	0	1	0	0	1	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

NE 156th Ave
NE 8th St

Date: 07/25/2023
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM





	HV %:	PHF
EB	1.2%	0.95
WB	0.9%	0.94
NB	1.1%	0.89
SB	1.5%	0.87
TOTAL	1.2%	0.96

Two-Hour Count Summaries

Interval Start		NE 8th St Eastbound				NE 8th St Westbound				NE 156th Ave Northbound				NE 156th Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	63	108	27	0	49	85	22	0	27	88	44	0	36	166	48	763	0
4:15 PM		**1**	**74**	**130**	**15**	**0**	**52**	**103**	**31**	**0**	**23**	**79**	**29**	**0**	**38**	**129**	**43**	**747**	0
4:30 PM		**0**	**68**	**110**	**37**	**0**	**52**	**110**	**35**	**0**	**25**	**98**	**29**	**0**	**43**	**151**	**59**	**817**	0
4:45 PM		**0**	**54**	**105**	**43**	**0**	**52**	**97**	**28**	**0**	**18**	**101**	**42**	**1**	**40**	**160**	**47**	**788**	3,115
5:00 PM		**0**	**53**	**112**	**32**	**0**	**58**	**94**	**31**	**0**	**10**	**85**	**32**	**0**	**33**	**183**	**70**	**793**	**3,145**
5:15 PM		0	61	109	29	0	50	83	33	0	17	88	29	0	33	130	79	741	3,139
5:30 PM		0	69	121	32	0	40	70	25	0	20	84	35	1	38	140	61	736	3,058
5:45 PM		0	77	113	31	0	44	97	24	0	21	94	40	0	32	106	60	739	3,009
Count Total		1	519	908	246	0	397	739	229	0	161	717	280	2	293	1,165	467	6,124	0
Peak Hour	**All**	**1**	**249**	**457**	**127**	**0**	**214**	**404**	**125**	**0**	**76**	**363**	**132**	**1**	**154**	**623**	**219**	**3,145**	**0**
	HV	**0**	**6**	**2**	**2**	**0**	**3**	**4**	**0**	**0**	**0**	**5**	**1**	**0**	**1**	**8**	**6**	**38**	**0**
	HV%	**0%**	**2%**	**0%**	**2%**	**-**	**1%**	**1%**	**0%**	**-**	**0%**	**1%**	**1%**	**0%**	**1%**	**1%**	**3%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	3	3	2	*9*	0	1	0	0	*1*	14	8	8	2	*32*
4:15 PM	**3**	**2**	**1**	**3**	***9***	**0**	**0**	**1**	**0**	***1***	**7**	**6**	**3**	**2**	*18*
4:30 PM	**4**	**1**	**2**	**4**	***11***	**0**	**0**	**0**	**0**	***0***	**7**	**11**	**10**	**14**	*42*
4:45 PM	**1**	**3**	**2**	**4**	***10***	**0**	**0**	**0**	**0**	***0***	**7**	**5**	**5**	**5**	*22*
5:00 PM	**2**	**1**	**1**	**4**	***8***	**0**	**0**	**0**	**0**	***0***	**11**	**8**	**3**	**7**	***29***
5:15 PM	2	1	2	2	*7*	0	0	0	1	*1*	16	15	11	12	*54*
5:30 PM	4	0	2	5	*11*	0	0	0	0	*0*	15	12	4	12	*43*
5:45 PM	3	2	3	3	*11*	0	0	1	0	*1*	13	8	5	9	*35*
Count Total	20	13	16	27	*76*	0	1	2	1	*4*	90	73	49	63	*275*
Peak Hour	**10**	**7**	**6**	**15**	***38***	**0**	**0**	**1**	**0**	***1***	**32**	**30**	**21**	**28**	***111***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 8th St Eastbound				NE 8th St Westbound				NE 156th Ave Northbound				NE 156th Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	0	0	0	0	3	0	0	0	1	2	0	0	1	1	9	0
4:15 PM	**0**	**1**	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**9**	0
4:30 PM	**0**	**2**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**2**	**2**	**11**	0
4:45 PM	**0**	**1**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**1**	**10**	39
5:00 PM	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**2**	**8**	**38**
5:15 PM	0	1	1	0	0	1	0	0	0	1	0	1	0	0	1	1	7	36
5:30 PM	0	3	1	0	0	0	0	0	0	0	1	1	0	0	3	2	11	36
5:45 PM	0	3	0	0	0	1	1	0	0	0	3	0	0	1	1	1	11	37
Count Total	0	14	4	2	0	5	8	0	0	1	10	5	0	2	14	11	76	0
Peak Hour	**0**	**6**	**2**	**2**	**0**	**3**	**4**	**0**	**0**	**0**	**5**	**1**	**0**	**1**	**8**	**6**	**38**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	NE 8th St Eastbound			NE 8th St Westbound			NE 156th Ave Northbound			NE 156th Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Count Total	0	0	0	0	1	0	0	2	0	1	0	0	4	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**

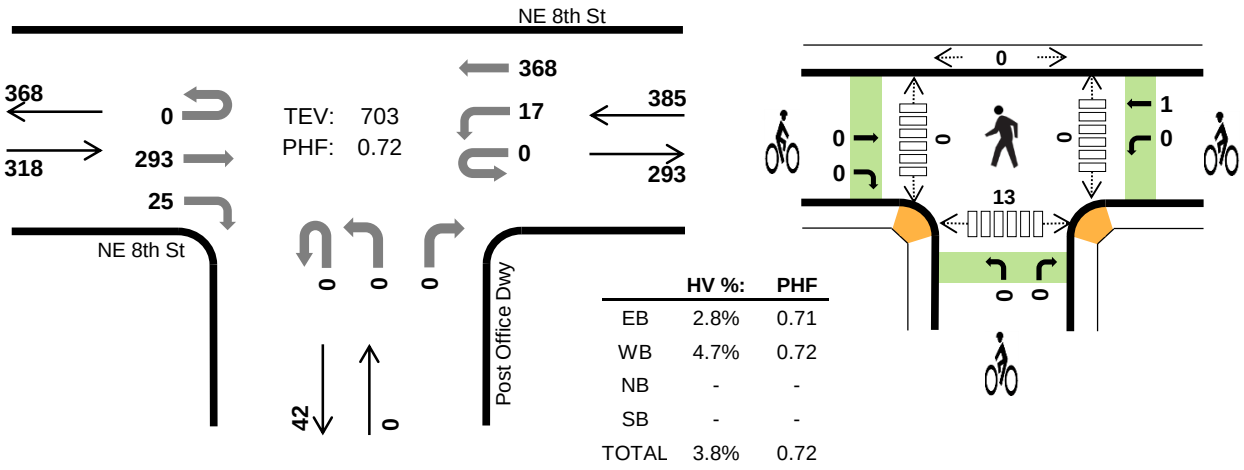
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Post Office Dwy
NE 8th St

N

Peak Hour

Date: 07/25/2023
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	2.8%	0.71
WB	4.7%	0.72
NB	-	-
SB	-	-
TOTAL	3.8%	0.72

Two-Hour Count Summaries

Interval Start		NE 8th St Eastbound				NE 8th St Westbound				Post Office Dwy Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	25	9	0	2	51	0	0	0	0	0	0	0	0	0	87	0
7:15 AM		0	0	30	13	0	1	51	0	0	0	0	0	0	0	0	0	95	0
7:30 AM		0	0	56	12	0	3	84	0	0	0	0	0	0	0	0	0	155	0
7:45 AM		0	0	57	2	0	0	65	0	0	0	0	0	0	0	0	0	124	461
8:00 AM		**0**	**0**	**44**	**5**	**0**	**0**	**70**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**119**	493
8:15 AM		**0**	**0**	**70**	**6**	**0**	**6**	**94**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**176**	574
8:30 AM		**0**	**0**	**75**	**6**	**0**	**1**	**81**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**163**	582
8:45 AM		**0**	**0**	**104**	**8**	**0**	**10**	**123**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**245**	**703**
Count Total		0	0	461	61	0	23	619	0	0	0	0	0	0	0	0	0	1,164	0
Peak Hour	**All**	**0**	**0**	**293**	**25**	**0**	**17**	**368**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**703**	**0**
	HV	**0**	**0**	**9**	**0**	**0**	**5**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**27**	**0**
	HV%	**-**	**-**	**3%**	**0%**	**-**	**29%**	**4%**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	3	3	0	0	*6*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	2	6	0	0	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	9	6	0	0	*15*	0	0	0	0	*0*	0	0	0	1	*1*
7:45 AM	4	3	0	0	*7*	0	1	0	0	*1*	0	0	0	2	*2*
8:00 AM	**2**	**4**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**3**	*3*
8:15 AM	**3**	**1**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**3**	*3*
8:30 AM	**3**	**7**	**0**	**0**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**3**	*3*
8:45 AM	**1**	**6**	**0**	**0**	***7***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**4**	***4***
Count Total	27	36	0	0	*63*	0	2	0	0	*2*	0	0	0	17	*17*
Peak Hr	**9**	**18**	**0**	**0**	***27***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**13**	***13***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 8th St				NE 8th St				Post Office Dwy				0				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	2	1	0	0	3	0	0	0	0	0	0	0	0	0	6	0
7:15 AM	0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	8	0
7:30 AM	0	0	9	0	0	0	6	0	0	0	0	0	0	0	0	0	15	0
7:45 AM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	7	36
8:00 AM	**0**	**0**	**2**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	36
8:15 AM	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	32
8:30 AM	**0**	**0**	**3**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	27
8:45 AM	**0**	**0**	**1**	**0**	**0**	**5**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**27**
Count Total	0	0	26	1	0	5	31	0	0	0	0	0	0	0	0	0	63	0
Peak Hour	**0**	**0**	**9**	**0**	**0**	**5**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**27**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	NE 8th St			NE 8th St			Post Office Dwy			0			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	1	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:45 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
Count Total	0	0	0	1	1	0	0	0	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

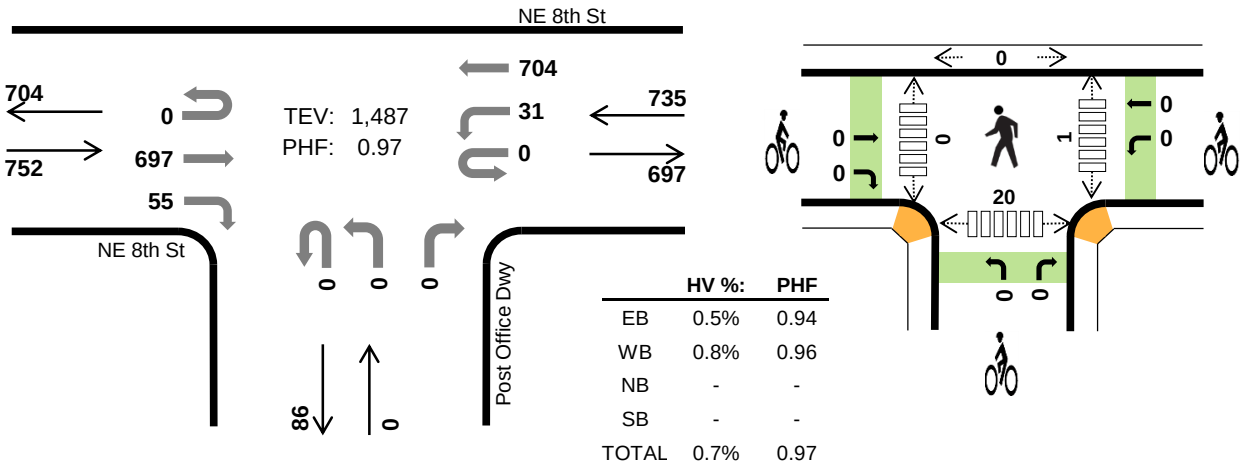
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Post Office Dwy
NE 8th St

N

Peak Hour

Date: 07/25/2023
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM



	HV %:	PHF
EB	0.5%	0.94
WB	0.8%	0.96
NB	-	-
SB	-	-
TOTAL	0.7%	0.97

Two-Hour Count Summaries

Interval Start	NE 8th St Eastbound				NE 8th St Westbound				Post Office Dwy Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	169	12	1	8	154	0	0	0	0	0	0	0	0	0	344	0
4:15 PM	**0**	**0**	**183**	**12**	**0**	**5**	**182**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**382**	0
4:30 PM	**0**	**0**	**162**	**21**	**0**	**8**	**183**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**374**	0
4:45 PM	**0**	**0**	**187**	**12**	**0**	**9**	**175**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**383**	1,483
5:00 PM	**0**	**0**	**165**	**10**	**0**	**9**	**164**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**348**	**1,487**
5:15 PM	0	0	154	12	0	8	136	0	0	0	0	0	0	0	0	0	310	1,415
5:30 PM	0	0	181	17	0	8	140	0	0	0	0	0	0	0	0	0	346	1,387
5:45 PM	0	0	175	13	0	4	149	0	0	0	0	0	0	0	0	0	341	1,345
Count Total	0	0	1,376	109	1	59	1,283	0	0	0	0	0	0	0	0	0	2,828	0
Peak Hour All	**0**	**0**	**697**	**55**	**0**	**31**	**704**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,487**	**0**
Peak Hour HV	**0**	**0**	**4**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**
Peak Hour HV%	**-**	**-**	**1%**	**0%**	**-**	**0%**	**1%**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	2	0	0	*3*	0	1	0	0	*1*	0	0	0	5	*5*
4:15 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**6**	*6*
4:30 PM	**2**	**1**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**7**	*7*
4:45 PM	**0**	**3**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**2**	*2*
5:00 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**5**	***6***
5:15 PM	3	1	0	0	*4*	1	0	0	0	*1*	0	0	0	10	*10*
5:30 PM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	0	1	*1*
5:45 PM	1	2	0	0	*3*	0	0	0	0	*0*	0	0	0	7	*7*
Count Total	11	11	0	0	*22*	1	1	0	0	*2*	1	0	0	43	*44*
Peak Hr	**4**	**6**	**0**	**0**	***10***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**20**	***21***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 8th St				NE 8th St				Post Office Dwy				0				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0
4:15 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	0
4:30 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	11
5:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**10**
5:15 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	4	12
5:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	11
5:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	11
Count Total	0	0	10	1	0	0	11	0	0	0	0	0	0	0	0	0	22	0
Peak Hour	**0**	**0**	**4**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**

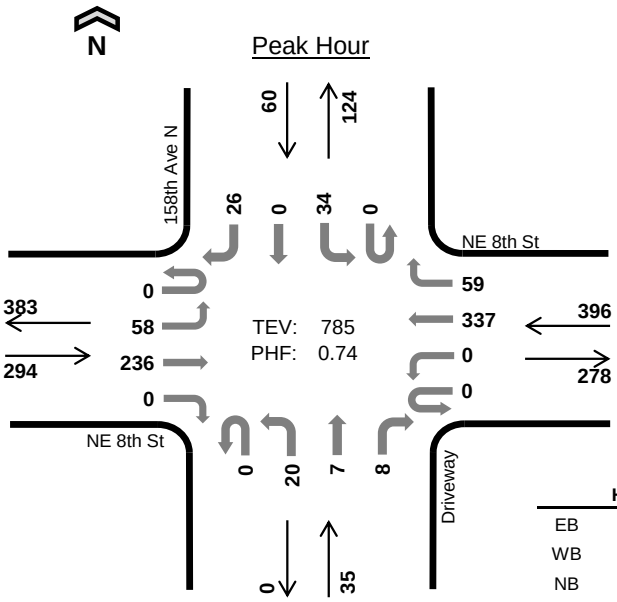
Two-Hour Count Summaries - Bikes

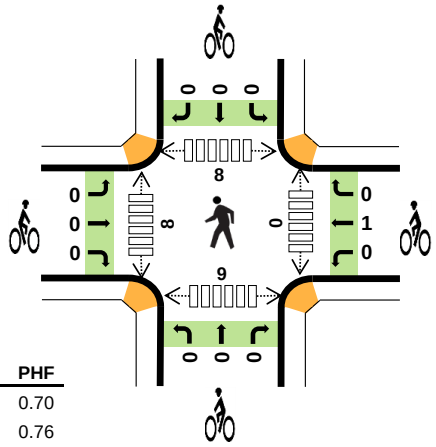
Interval Start	NE 8th St			NE 8th St			Post Office Dwy			0			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	1	0	1	0	0	0	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

158th Ave N
NE 8th St

Date: 07/25/2023
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	3.1%	0.70
WB	3.3%	0.76
NB	0.0%	0.51
SB	1.7%	0.94
TOTAL	2.9%	0.74

Two-Hour Count Summaries

Interval Start		NE 8th St Eastbound				NE 8th St Westbound				Driveway Northbound				158th Ave N Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	4	21	0	0	0	49	2	0	4	1	4	0	1	0	1	87	0
7:15 AM		0	8	22	0	0	0	45	8	0	1	0	0	0	3	0	8	95	0
7:30 AM		0	12	43	0	0	0	72	8	0	9	0	0	0	2	0	5	151	0
7:45 AM		0	15	42	0	0	0	56	10	0	1	0	0	0	4	0	8	136	469
8:00 AM		**0**	**8**	**37**	**0**	**0**	**0**	**59**	**25**	**0**	**3**	**0**	**2**	**0**	**8**	**0**	**7**	**149**	531
8:15 AM		**0**	**10**	**60**	**0**	**0**	**0**	**88**	**12**	**0**	**4**	**3**	**1**	**0**	**7**	**0**	**9**	**194**	630
8:30 AM		**0**	**19**	**55**	**0**	**0**	**0**	**74**	**8**	**0**	**3**	**1**	**1**	**0**	**9**	**0**	**7**	**177**	656
8:45 AM		**0**	**21**	**84**	**0**	**0**	**0**	**116**	**14**	**0**	**10**	**3**	**4**	**0**	**10**	**0**	**3**	**265**	**785**
Count Total		0	97	364	0	0	0	559	87	0	35	8	12	0	44	0	48	1,254	0
Peak Hour	**All**	**0**	**58**	**236**	**0**	**0**	**0**	**337**	**59**	**0**	**20**	**7**	**8**	**0**	**34**	**0**	**26**	**785**	**0**
	HV	**0**	**1**	**8**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**23**	**0**
	HV%	**-**	**2%**	**3%**	**-**	**-**	**-**	**4%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**-**	**4%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	4	1	1	*8*	0	0	0	0	*0*	0	0	0	1	*1*
7:15 AM	2	3	0	3	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	9	6	0	1	*16*	0	0	0	0	*0*	0	0	0	1	*1*
7:45 AM	4	2	0	2	*8*	0	0	0	0	*0*	0	1	4	0	*5*
8:00 AM	**2**	**3**	**0**	**1**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**2**	*4*
8:15 AM	**3**	**2**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**1**	**3**	*8*
8:30 AM	**3**	**6**	**0**	**0**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**2**	**1**	*4*
8:45 AM	**1**	**2**	**0**	**0**	***3***	**0**	**1**	**0**	**0**	***1***	**0**	**3**	**3**	**3**	***9***
Count Total	26	28	1	8	*63*	0	1	0	0	*1*	0	9	12	11	*32*
Peak Hour	**9**	**13**	**0**	**1**	***23***	**0**	**1**	**0**	**0**	***1***	**0**	**8**	**8**	**9**	***25***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 8th St Eastbound				NE 8th St Westbound				Driveway Northbound				158th Ave N Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	1	0	0	0	4	0	0	0	0	1	0	0	0	1	8	0
7:15 AM	0	1	1	0	0	0	3	0	0	0	0	0	0	0	0	3	8	0
7:30 AM	0	3	6	0	0	0	6	0	0	0	0	0	0	0	0	1	16	0
7:45 AM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	2	8	40
8:00 AM	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**6**	38
8:15 AM	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	35
8:30 AM	**0**	**1**	**2**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	28
8:45 AM	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**23**
Count Total	0	6	20	0	0	0	28	0	0	0	0	1	0	0	0	8	63	0
Peak Hour	**0**	**1**	**8**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**23**	**0**

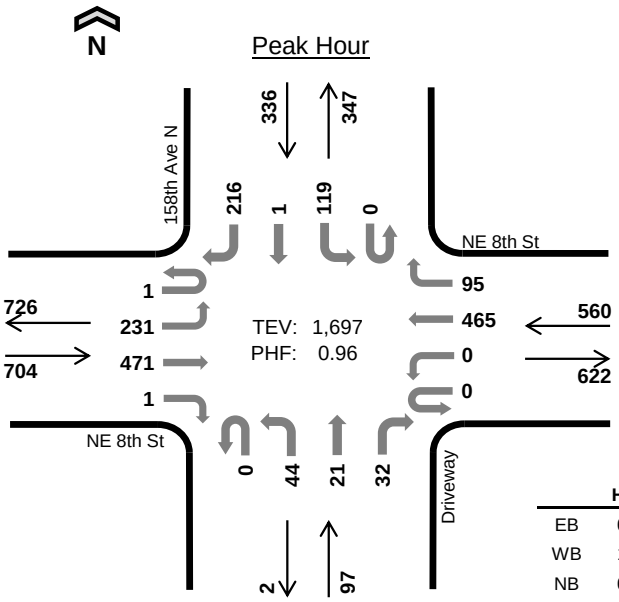
Two-Hour Count Summaries - Bikes

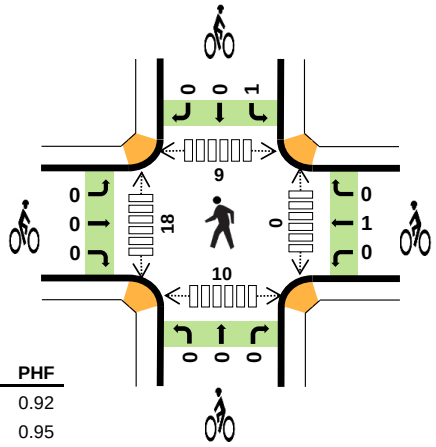
Interval Start	NE 8th St Eastbound			NE 8th St Westbound			Driveway Northbound			158th Ave N Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:45 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
Count Total	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

158th Ave N
NE 8th St

Date: 07/25/2023
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM





	HV %:	PHF
EB	0.6%	0.92
WB	1.3%	0.95
NB	0.0%	0.84
SB	0.0%	0.89
TOTAL	0.6%	0.96

Two-Hour Count Summaries

Interval Start		NE 8th St Eastbound				NE 8th St Westbound				Driveway Northbound				158th Ave N Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**64**	**107**	**0**	**0**	**0**	**101**	**30**	**0**	**13**	**4**	**7**	**0**	**29**	**1**	**50**	**406**	0
4:15 PM		**0**	**56**	**121**	**1**	**0**	**0**	**122**	**25**	**0**	**10**	**3**	**4**	**0**	**26**	**0**	**54**	**422**	0
4:30 PM		**0**	**55**	**109**	**0**	**0**	**0**	**117**	**22**	**0**	**13**	**6**	**10**	**0**	**36**	**0**	**58**	**426**	0
4:45 PM		**1**	**56**	**134**	**0**	**0**	**0**	**125**	**18**	**0**	**8**	**8**	**11**	**0**	**28**	**0**	**54**	**443**	**1,697**
5:00 PM		1	48	116	0	0	0	113	16	0	10	3	7	0	39	0	47	400	1,691
5:15 PM		0	56	101	0	0	0	80	16	0	12	2	7	0	41	0	50	365	1,634
5:30 PM		1	48	128	0	0	0	92	32	0	12	5	5	0	28	0	44	395	1,603
5:45 PM		0	56	118	0	0	0	97	23	0	12	3	6	0	38	0	46	399	1,559
Count Total		3	439	934	1	0	0	847	182	0	90	34	57	0	265	1	403	3,256	0
Peak Hour	**All**	**1**	**231**	**471**	**1**	**0**	**0**	**465**	**95**	**0**	**44**	**21**	**32**	**0**	**119**	**1**	**216**	**1,697**	**0**
	HV	**0**	**0**	**4**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**
	HV%	**0%**	**0%**	**1%**	**0%**	**-**	**-**	**2%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**1**	**2**	**0**	**0**	***3***	**0**	**1**	**0**	**0**	***1***	**0**	**5**	**1**	**4**	*10*
4:15 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**3**	*7*
4:30 PM	**2**	**1**	**0**	**0**	***3***	**0**	**0**	**0**	**1**	***1***	**0**	**6**	**4**	**1**	*11*
4:45 PM	**0**	**3**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**4**	**2**	***9***
5:00 PM	1	0	0	1	*2*	0	0	0	0	*0*	0	7	0	4	*11*
5:15 PM	3	0	0	1	*4*	0	0	0	0	*0*	0	12	8	10	*30*
5:30 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	2	2	0	*4*
5:45 PM	1	3	0	0	*4*	0	0	0	1	*1*	0	4	3	2	*9*
Count Total	10	10	0	2	*22*	0	1	0	2	*3*	0	43	22	26	*91*
Peak Hour	**4**	**7**	**0**	**0**	***11***	**0**	**1**	**0**	**1**	***2***	**0**	**18**	**9**	**10**	***37***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 8th St Eastbound				NE 8th St Westbound				Driveway Northbound				158th Ave N Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	0
4:15 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	0
4:30 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**11**
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	10
5:15 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	4	12
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10
5:45 PM	0	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0	4	11
Count Total	0	0	10	0	0	0	9	1	0	0	0	0	0	0	0	2	22	0
Peak Hour	**0**	**0**	**4**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**

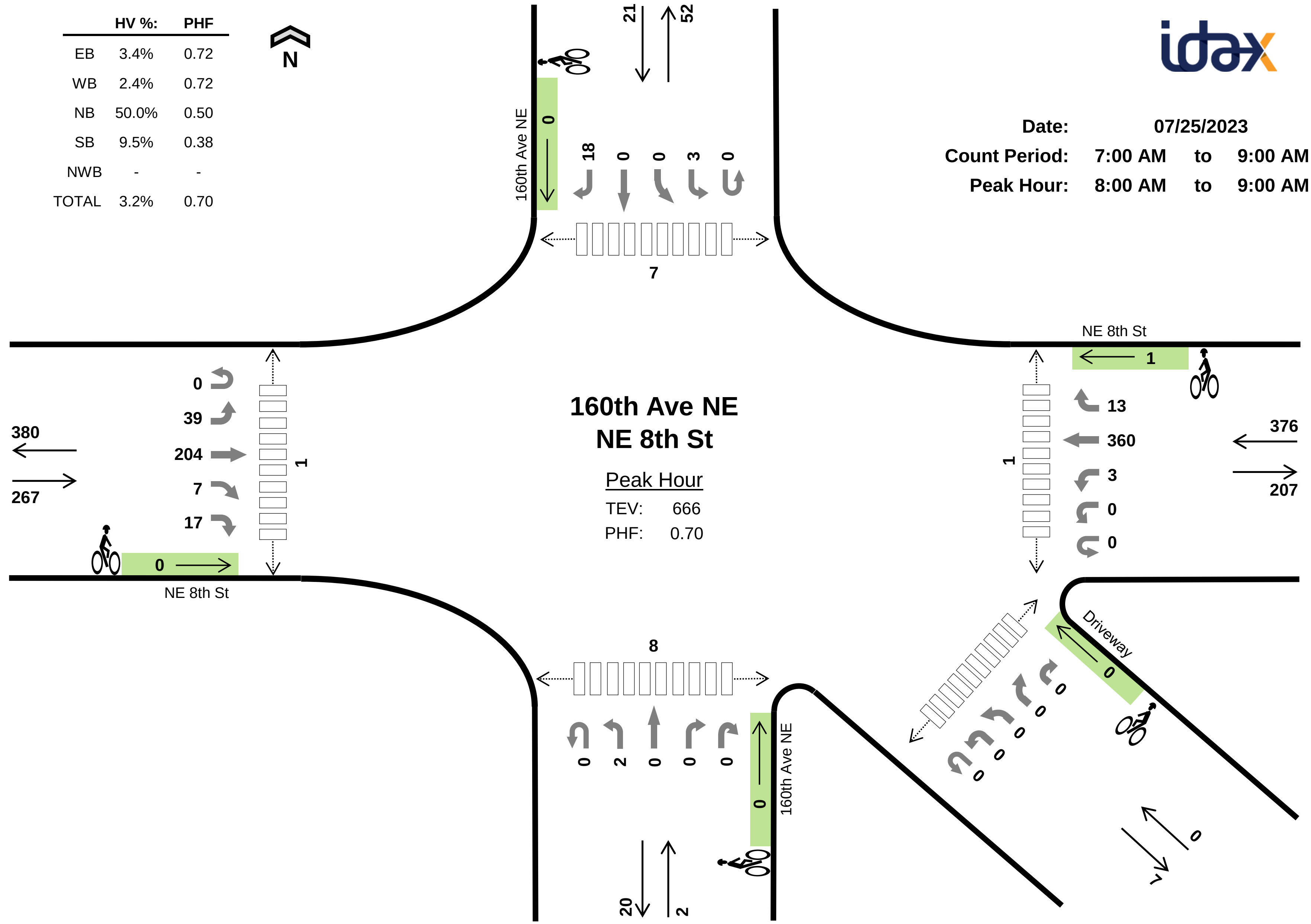
Two-Hour Count Summaries - Bikes

Interval Start	NE 8th St Eastbound			NE 8th St Westbound			Driveway Northbound			158th Ave N Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Count Total	0	0	0	0	1	0	0	0	0	2	0	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

	HV %:	PHF
EB	3.4%	0.72
WB	2.4%	0.72
NB	50.0%	0.50
SB	9.5%	0.38
NWB	-	-
TOTAL	3.2%	0.70

Date: 07/25/2023
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



160th Ave NE
NE 8th St

Peak Hour
TEV: 666
PHF: 0.70

Two-Hour Count Summaries

Interval Start	NE 8th St Eastbound					NE 8th St Westbound					160th Ave NE Northbound					160th Ave NE Southbound					Driveway Northwestbound					15-min Total	Rolling One Hour
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	23	0	1	0	0	1	47	3	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	78	0
7:15 AM	0	1	21	0	1	0	0	0	56	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	80	0
7:30 AM	0	8	34	0	2	0	0	0	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121	0
7:45 AM	0	3	42	0	1	0	0	0	73	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	122	401
8:00 AM	**0**	**1**	**41**	**0**	**1**	**0**	**0**	**1**	**70**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**117**	440
8:15 AM	**0**	**6**	**55**	**1**	**1**	**0**	**0**	**0**	**98**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**165**	525
8:30 AM	**0**	**15**	**42**	**4**	**7**	**0**	**0**	**0**	**70**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**146**	550
8:45 AM	**0**	**17**	**66**	**2**	**8**	**0**	**0**	**2**	**122**	**6**	**0**	**1**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**238**	**666**
Count Total	0	51	324	7	22	0	0	4	613	18	0	2	0	1	0	0	5	0	0	20	0	0	0	0	0	1,067	0
Peak Hour All	**0**	**39**	**204**	**7**	**17**	**0**	**0**	**3**	**360**	**13**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**18**	**0**	**0**	**0**	**0**	**0**	**666**	**0**
Peak Hour HV	**0**	**1**	**8**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**21**	**0**
Peak Hour HV%	**-**	**3%**	**4%**	**0%**	**0%**	**-**	**-**	**0%**	**3%**	**0%**	**-**	**50%**	**-**	**-**	**-**	**-**	**0%**	**-**	**-**	**11%**	**-**	**-**	**-**	**-**	**-**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	NWB	Total	EB	WB	NB	SB	NWB	Total	East	West	North	South	Southeast	Total
7:00 AM	2	6	1	0	0	*9*	0	0	0	0	0	*0*	0	0	0	1	1	*2*
7:15 AM	1	2	0	0	0	*3*	0	0	0	0	0	*0*	0	0	0	0	0	*0*
7:30 AM	3	7	0	0	0	*10*	0	0	0	0	0	*0*	0	1	2	0	0	*3*
7:45 AM	6	2	0	0	0	*8*	0	0	0	0	0	*0*	0	0	1	1	1	*3*
8:00 AM	**1**	**3**	**0**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**3**	**3**	**3**	***10***
8:15 AM	**4**	**1**	**1**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**2**	**2**	***5***
8:30 AM	**2**	**5**	**0**	**1**	**0**	***8***	**0**	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**2**	**1**	**0**	***4***
8:45 AM	**2**	**0**	**0**	**1**	**0**	***3***	**0**	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**1**	**2**	**1**	***4***
Count Total	21	26	2	2	0	*51*	0	1	0	0	0	*1*	1	2	10	10	8	*31*
Peak Hr	**9**	**9**	**1**	**2**	**0**	***21***	**0**	**1**	**0**	**0**	**0**	***1***	**1**	**1**	**7**	**8**	**6**	*23*

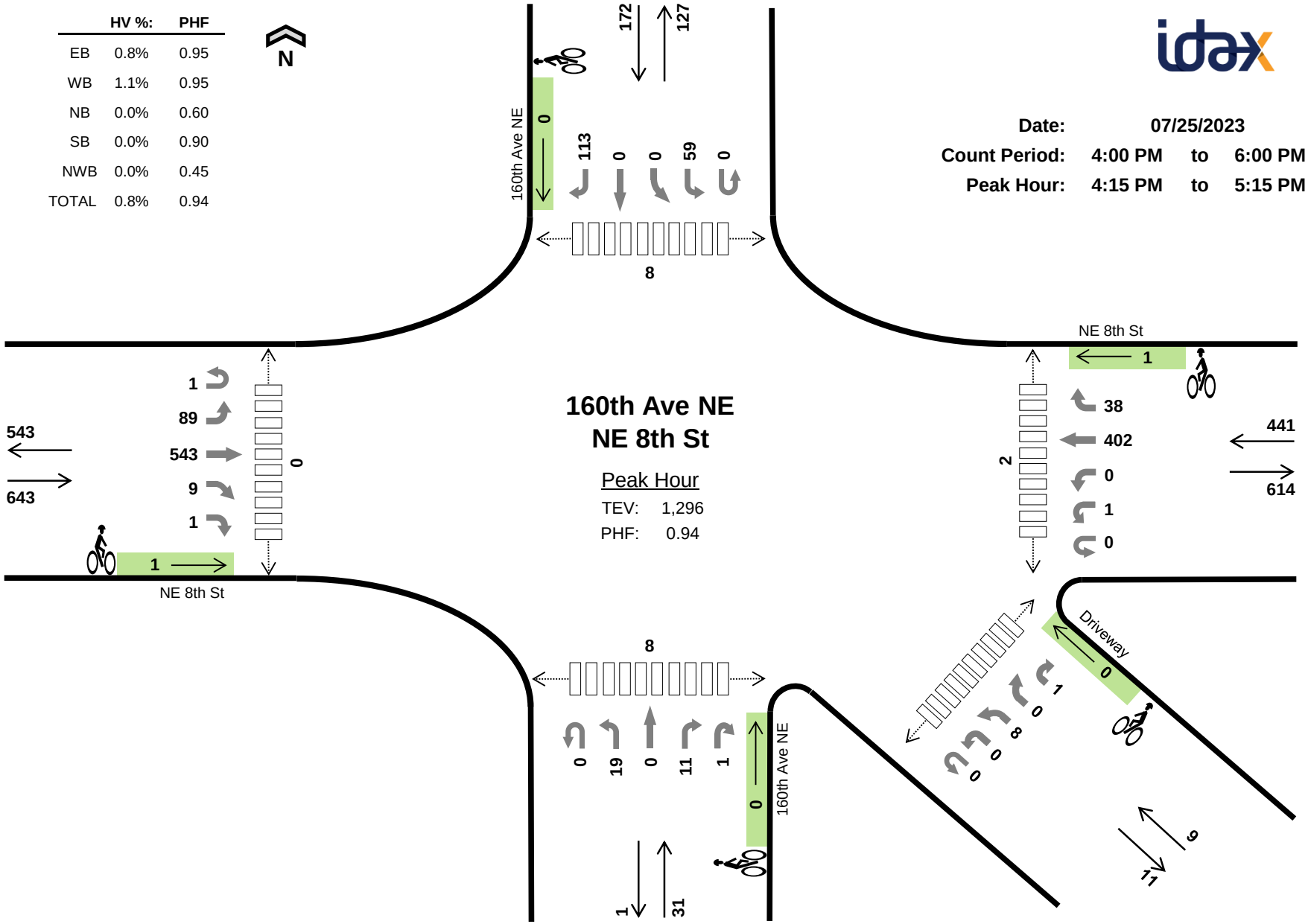
Two-Hour Count Summaries - Heavy Vehicles

Interval Start	NE 8th St					NE 8th St					160th Ave NE					160th Ave NE					Driveway					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	1	0	1	0	0	0	5	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	9	0
7:15 AM	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
7:30 AM	0	1	2	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
7:45 AM	0	0	6	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	30
8:00 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	25
8:15 AM	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	28
8:30 AM	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**8**	26
8:45 AM	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**21**
Count Total	0	2	18	0	1	0	0	0	25	1	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	51	0
Peak Hour	**0**	**1**	**8**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	21	**0**

Two-Hour Count Summaries - Bikes

Interval Start	NE 8th St					NE 8th St					160th Ave NE					160th Ave NE					Driveway					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
Count Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1	**0**

	HV %:	PHF
EB	0.8%	0.95
WB	1.1%	0.95
NB	0.0%	0.60
SB	0.0%	0.90
NWB	0.0%	0.45
TOTAL	0.8%	0.94



Two-Hour Count Summaries

Interval Start	NE 8th St Eastbound					NE 8th St Westbound					160th Ave NE Northbound					160th Ave NE Southbound					Driveway Northwestbound					15-min Total	Rolling One Hour
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	22	112	4	0	0	0	0	102	14	0	5	0	1	0	0	19	0	0	23	0	0	2	0	0	304	0
4:15 PM	**0**	**20**	**135**	**1**	**0**	**0**	**0**	**0**	**99**	**5**	**0**	**3**	**0**	**2**	**0**	**0**	**15**	**0**	**0**	**31**	**0**	**0**	**4**	**0**	**1**	**316**	0
4:30 PM	**0**	**16**	**135**	**3**	**0**	**0**	**0**	**0**	**109**	**3**	**0**	**6**	**0**	**1**	**0**	**0**	**14**	**0**	**0**	**23**	**0**	**0**	**1**	**0**	**0**	**311**	0
4:45 PM	**0**	**25**	**142**	**3**	**0**	**0**	**1**	**0**	**99**	**16**	**0**	**4**	**0**	**2**	**0**	**0**	**15**	**0**	**0**	**33**	**0**	**0**	**3**	**0**	**0**	**343**	1,274
5:00 PM	**1**	**28**	**131**	**2**	**1**	**0**	**0**	**0**	**95**	**14**	**0**	**6**	**0**	**6**	**1**	**0**	**15**	**0**	**0**	**26**	**0**	**0**	**0**	**0**	**0**	**326**	**1,296**
5:15 PM	0	20	126	1	0	0	1	0	75	10	0	2	0	1	0	0	13	1	0	18	0	0	2	0	2	272	1,252
5:30 PM	0	23	137	2	0	0	0	0	93	8	0	1	0	0	0	0	13	0	0	24	0	0	2	0	1	304	1,245
5:45 PM	0	20	139	2	0	0	1	0	100	9	0	2	0	2	0	0	7	0	0	19	0	0	1	0	0	302	1,204
Count Total	1	174	1,057	18	1	0	3	0	772	79	0	29	0	15	1	0	111	1	0	197	0	0	15	0	4	2,478	0
Peak Hour All	**1**	**89**	**543**	**9**	**1**	**0**	**1**	**0**	**402**	**38**	**0**	**19**	**0**	**11**	**1**	**0**	**59**	**0**	**0**	**113**	**0**	**0**	**8**	**0**	**1**	**1,296**	**0**
Peak Hour HV	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**
Peak Hour HV%	**0%**	**0%**	**1%**	**0%**	**0%**	**-**	**0%**	**-**	**1%**	**0%**	**-**	**0%**	**-**	**0%**	**0%**	**-**	**0%**	**-**	**-**	**0%**	**-**	**-**	**0%**	**-**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	NWB	Total	EB	WB	NB	SB	NWB	Total	East	West	North	South	Southeast	Total
4:00 PM	1	2	0	0	0	*3*	0	0	1	0	0	*1*	0	0	2	0	0	*2*
4:15 PM	**2**	**2**	**0**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	**0**	***0***
4:30 PM	**1**	**1**	**0**	**0**	**0**	***2***	**1**	**1**	**0**	**0**	**0**	***2***	**0**	**0**	**3**	**3**	**3**	***9***
4:45 PM	**1**	**1**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**3**	**3**	**2**	***8***
5:00 PM	**1**	**1**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**2**	**2**	**2**	***8***
5:15 PM	3	1	0	0	0	*4*	0	1	0	0	0	*1*	0	0	5	1	1	*7*
5:30 PM	0	1	0	0	0	*1*	0	0	0	0	0	*0*	2	0	2	1	1	*6*
5:45 PM	1	1	0	0	0	*2*	1	0	0	0	0	*1*	0	0	2	2	0	*4*
Count Total	10	10	0	0	0	*20*	2	2	1	0	0	*5*	4	0	19	12	9	*44*
Peak Hr	**5**	**5**	**0**	**0**	**0**	***10***	**1**	**1**	**0**	**0**	**0**	***2***	**2**	**0**	**8**	**8**	**7**	*25*

Two-Hour Count Summaries - Heavy Vehicles

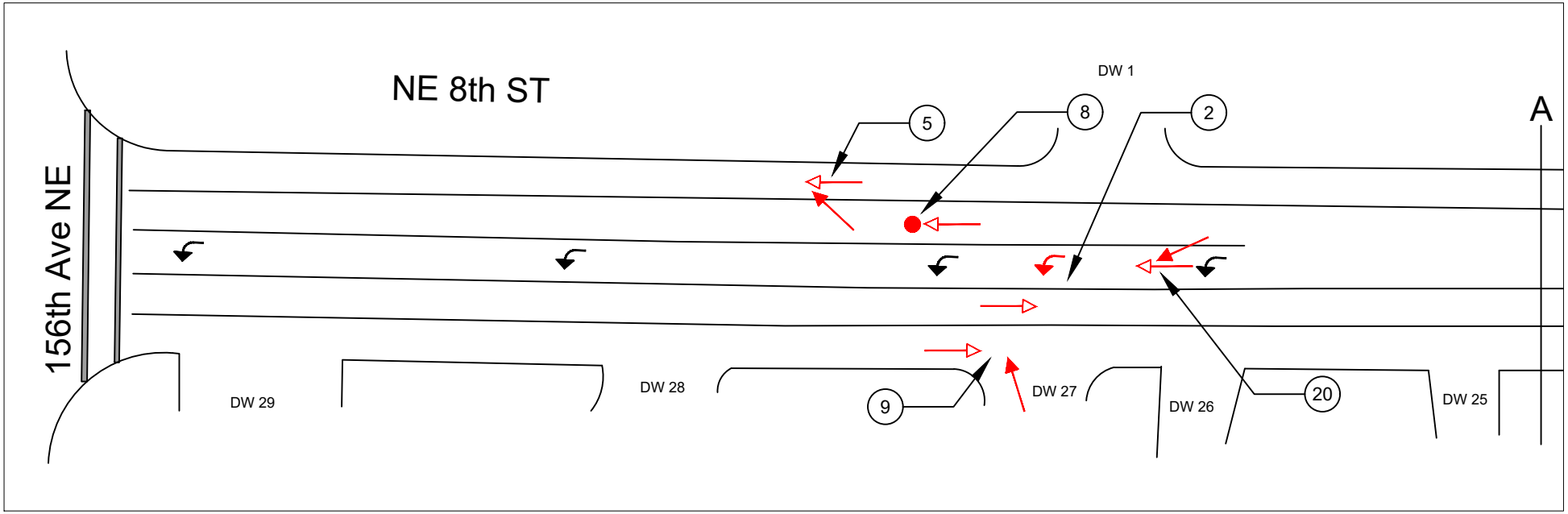
Interval Start	NE 8th St					NE 8th St					160th Ave NE					160th Ave NE					Driveway					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
4:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	0
4:30 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	0
4:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	11
5:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**10**
5:15 PM	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	10
5:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
5:45 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9
Count Total	0	0	10	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
Peak Hour	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	10	**0**

Two-Hour Count Summaries - Bikes

Interval Start	NE 8th St					NE 8th St					160th Ave NE					160th Ave NE					Driveway					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Count Total	0	0	2	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2	**0**

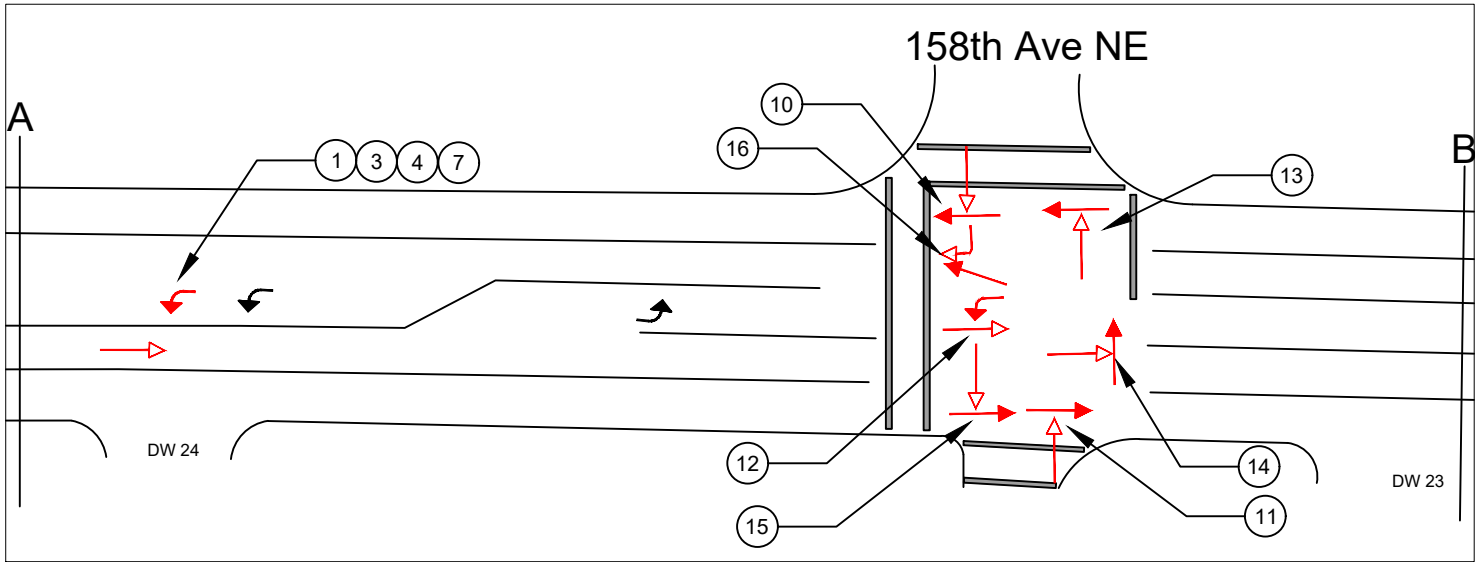
APPENDIX B

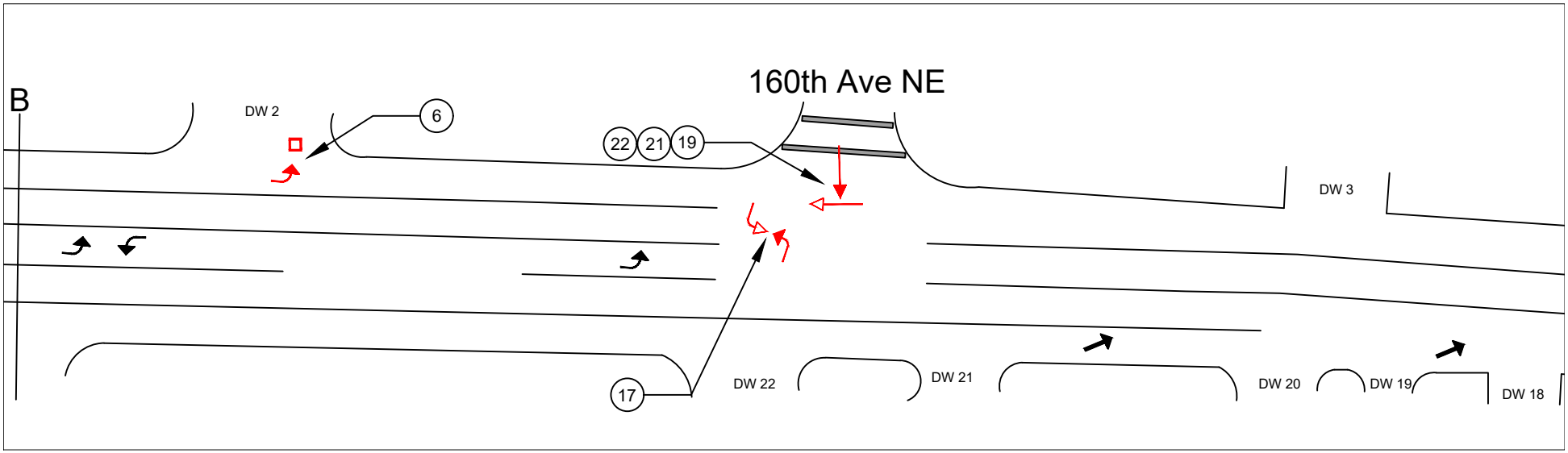
Collision Diagram



LEGEND

- Vehicle at fault
- Vehicle not at fault
- Vehicle traveling in reverse
- Vehicle's final collision angle & previous path
- Pedestrian at fault
- Pedestrian not at fault
- Bicycle at fault
- Bicycle not at fault





LEGEND

- Vehicle at fault
- Vehicle not at fault
- Vehicle traveling in reverse
- Vehicle's final collision angle & previous path
- Pedestrian at fault
- Pedestrian not at fault
- Bicycle at fault
- Bicycle not at fault

INTERSECTION COLLISION INFORMATION							
NO.	CASE NUMBER	DATE	DAY	TIME	DAMAGE	ACCTYPE	ADDITIONAL NOTES
1	1805161	1/26/18	FRI	15:53	C	AT	
2	1834599	6/22/18	FRI	13:28	O	AR	
3	1837385	7/6/18	FRI	13:15	O	AR	
4	1927045	5/25/19	SAT	13:05	O	AR	
5	1935140	7/5/19	FRI	15:00	O	SS/LC	
6	2113523	3/20/21	SAT	14:35	A	BIKE	
7	2157259	11/20/21	SAT	10:55	O	AT	
8	2206350	2/4/22	FRI	18:37	O	PED	PED2 was not walking at a crosswalk. V1's front fender hit PED2
9	2266817	12/12/22	MON	12:54	O	RA	
10	1827065	5/16/18	WED	14:46	O	RA	
11	1855656	10/8/18	MON	16:17	O	RA	
12	1959253	11/7/19	THU	12:45	O	AT	
13	2016669	3/30/20	MON	18:52	O	RA	
14	2039317	8/22/20	SAT	15:00	O	RA	
15	2158877	11/29/21	MON	10:47	C	RA	
16	2217529	4/4/22	MON	18:00	O	SS/LC	
17	1806427	2/1/18	THU	18:56	O	HO	
18	1841013	7/24/18	TUE	18:46	O	OT	V1 front passenger side collided with V2 rear passenger side
19	2153274	10/28/21	THU	22:03	O	RA	
20	2153463	10/29/21	FRI	19:07	O	SS/LC	
21	2206923	2/7/22	MON	19:41	O	RA	
22	2225841	5/18/22	WED	13:00	C	RA	

KABCO Designations

KABCO - Description (Deprecated City Standard)

K - Fatal Injury (F)
A - Disabling Injury (DI)
B - Non-Disabling Injury (NDI)
C - Possible Injury (PI)
O - Property Damage Only (PDO)

Collision Type Key

Type - Description

RA - Right Angle
AT - Approach Turn
SS/LC - Sideswipe/Lane Change
PV/FO - Parked Vehicle / Fixed Object
HO - Head On
RE - Rear End
OT - Other

APPENDIX C

Pedestrian/Bicyclist Data from COB Traffic Cameras

Videos provided by City of Bellevue.

156th Camera					
Date	**Video**	**Peds Going North**	**Peds Going South**	**Peds Midblock**	**Bikes**
8/10/2023	156 NE 8- - E 2023-08-10_00_00_00_862	7	8	1 NB	
	156 NE 8- - E 2023-08-10_03_59_59_793	15	4		3 using roadway
	156 NE 8- - E 2023-08-10_08_00_00_543	62	33	2 NB	1 using roadway
	156 NE 8- - E 2023-08-10_12_00_02_570	63	63	1 SB	3 using roadway, 10 using sidewalk
	156 NE 8- - E 2023-08-10_16_00_02_014	56	88	2 SB	2 using roadway, 4 using sidewalk
8/12/2023	156 NE 8 -- E 2023-08-12_00_00_01_665	7	10	1 SB, 1 NB	
	156 NE 8 -- E 2023-08-12_03_59_59_319	4	5	1 SB	1 using sidewalk
	156 NE 8-- E 2023-08-12_08_00_00_120	44	30	1 SB, 4 NB	3 using sidewalk
	156 NE 8-- E 2023-08-12_11_59_59_697	65	55	2 SB, 3 NB	3 using sidewalk
	156 NE 8 -- E 2023-08-12_15_59_406	58	56		
	156 NE 8 -- E 2023-08-12_00_00_222	23	37	3 SB, 4 NB	5 using sidewalk

158th Camera				
Date	**Video**	**Peds Going North**	**Peds Going South**	**Bikes**
8/10/2023	158 NE 8 - Center 2023-08-10_00_00_00_862	0	0	1 using sidewalk
	158 NE 8 - Center 2023-08-10_03_59_59_793	1	0	1 using sidewalk
	158 NE 8 - Center 2023-08-10_08_00_00_543	29	15	
	158 NE 8 - Center 2023-08-10_12_00_02_570	34	33	3 using sidewalk
	158 NE 8 - Center 2023-08-10_16_00_02_014	29	41	6 using sidewalk
8/12/2023	158 NE 8 - Center-08012_00_00_01_665	1	1	
	158 NE 8 - Center 2023-08-12_03_59_59_319	1	2	
	158 NE 8-- Center 2023-08-12_08_00_00_120	17	16	2 using sidewalk
	158 NE 8 -- Center 2023-08-12_11_59_54_960	26	19	
	156 NE 8 -- Center 2023-08-12_15_59_406	18	17	2 using sidewalk
	158 NE 8 -- Center 2023-08-12_00_00_222	6	7	

APPENDIX D

Existing Conditions 2023 SimTraffic Modeling Reports

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	22.7	49.8	0.3	20
Post Office Dwy	2	2.4	13.8	0.1	24
158th	3	8.8	13.3	0.0	11
160th	4	1.5	9.5	0.1	26
Total		35.4	86.4	0.5	20

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.5	3.8	0.1	59
158th	3	17.7	25.4	0.1	10
Post Office Dwy	2	1.7	6.5	0.0	22
156th	1	28.4	38.4	0.1	9
Total		48.2	74.2	0.3	13

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.8	0.4
Total Del/Veh (s)	20.8	26.1	17.8	13.0	19.2

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.7	1.7	1.7

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1	0.0
Total Del/Veh (s)	9.6	16.0	8.3	12.6	12.9

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.1
Total Del/Veh (s)	1.7	0.5	3.7	2.7	1.1

Total Zone Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	275.0

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	86	92	78	52	128	121	83	120	129	58	108	64
Average Queue (ft)	52	61	44	27	87	85	47	77	96	29	72	29
95th Queue (ft)	98	102	87	63	137	136	92	133	144	66	125	82
Link Distance (ft)		1404	1404		417	417		303	303		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			500			100			415		
Storage Blk Time (%)							1	3				0
Queuing Penalty (veh)							1	3				0

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	58
Average Queue (ft)	36
95th Queue (ft)	65
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Post Office Dwy & NE 8th

Movement	WB
Directions Served	L
Maximum Queue (ft)	14
Average Queue (ft)	4
95th Queue (ft)	22
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	40
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

Intersection: 3: 158th & NE 8th

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	R
Maximum Queue (ft)	66	98	46	131	87	30	28	45	32
Average Queue (ft)	31	52	15	92	57	10	11	24	14
95th Queue (ft)	73	108	60	141	99	37	35	54	40
Link Distance (ft)		162	162	308	308	246	246	392	392
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	60								
Storage Blk Time (%)	1	6							
Queuing Penalty (veh)	1	3							

Intersection: 4: 160th & NE 8th

Movement	EB	WB	WB	NB	SB
Directions Served	L	LT	TR	LTR	LTR
Maximum Queue (ft)	20	6	8	17	34
Average Queue (ft)	7	1	2	5	15
95th Queue (ft)	27	11	16	29	43
Link Distance (ft)				72	274
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	60				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 9

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	Max	Max	Max	Max	Max	Max	Max	Max
Avg. Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
g/C Ratio	NA	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100	100	100	100
Cycles with Peds (%)	0	33	0	17	0	29	0	17

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	13	0	14	14

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	37.1	62.0	0.3	16
Post Office Dwy	2	7.4	18.2	0.1	18
158th	3	12.9	17.4	0.0	8
160th	4	3.2	11.4	0.1	22
Total		60.6	109.1	0.5	16

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.6	4.1	0.1	56
158th	3	20.7	28.2	0.1	9
Post Office Dwy	2	2.1	7.1	0.0	20
156th	1	36.8	45.5	0.1	7
Total		60.1	84.8	0.3	11

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.0	1.3	0.4
Total Del/Veh (s)	39.6	37.0	19.8	16.2	28.8

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.7	1.9	3.8

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.1
Total Del/Veh (s)	16.2	19.5	13.5	11.7	16.3

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.1	0.2	0.1
Total Del/Veh (s)	2.9	0.6	6.7	9.7	3.1

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	346.9

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	254	240	231	180	218	251	101	145	154	107	198	167
Average Queue (ft)	176	185	163	133	158	188	55	94	112	72	144	110
95th Queue (ft)	291	285	271	223	242	275	117	167	179	126	225	191
Link Distance (ft)		1404	1404		417	417		303	303		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			500			100			415		
Storage Blk Time (%)							1	7				1
Queuing Penalty (veh)							2	5				3

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	86
Average Queue (ft)	46
95th Queue (ft)	102
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 2: Post Office Dwy & NE 8th

Movement	EB	EB	WB	WB
Directions Served	T	TR	L	T
Maximum Queue (ft)	141	54	39	18
Average Queue (ft)	62	13	16	4
95th Queue (ft)	169	74	46	33
Link Distance (ft)	417	417		162
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			40	
Storage Blk Time (%)			1	
Queuing Penalty (veh)			4	

Intersection: 3: 158th & NE 8th

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	L	TR	L	R
Maximum Queue (ft)	84	186	150	171	137	46	43	93	87
Average Queue (ft)	78	152	79	132	99	21	21	62	52
95th Queue (ft)	95	212	168	187	159	53	52	102	93
Link Distance (ft)		162	162	308	308	246	246	392	392
Upstream Blk Time (%)		11	0						
Queuing Penalty (veh)		38	1						
Storage Bay Dist (ft)	60								
Storage Blk Time (%)	20	22							
Queuing Penalty (veh)	48	47							

Intersection: 4: 160th & NE 8th

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	LT	TR	LTR	LTR
Maximum Queue (ft)	36	5	3	3	27	79
Average Queue (ft)	22	1	1	1	15	53
95th Queue (ft)	48	13	7	8	37	92
Link Distance (ft)		308			72	274
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	60					
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Zone Summary

Zone wide Queuing Penalty: 148

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	5.0	44.0	8.0	43.0	8.0	41.0	13.0	38.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	None	C-Min	None	None	None	C-Min	None	None
Avg. Green (s)	18.0	58.2	17.6	34.6	8.0	53.5	13.8	38.2
g/C Ratio	-0.01	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	67	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	33	100	100	0	75	100	75	25
Cycles with Peds (%)	0	50	0	50	0	50	0	50

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	13	0	14	29

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

APPENDIX E

Design Alternative Exhibits

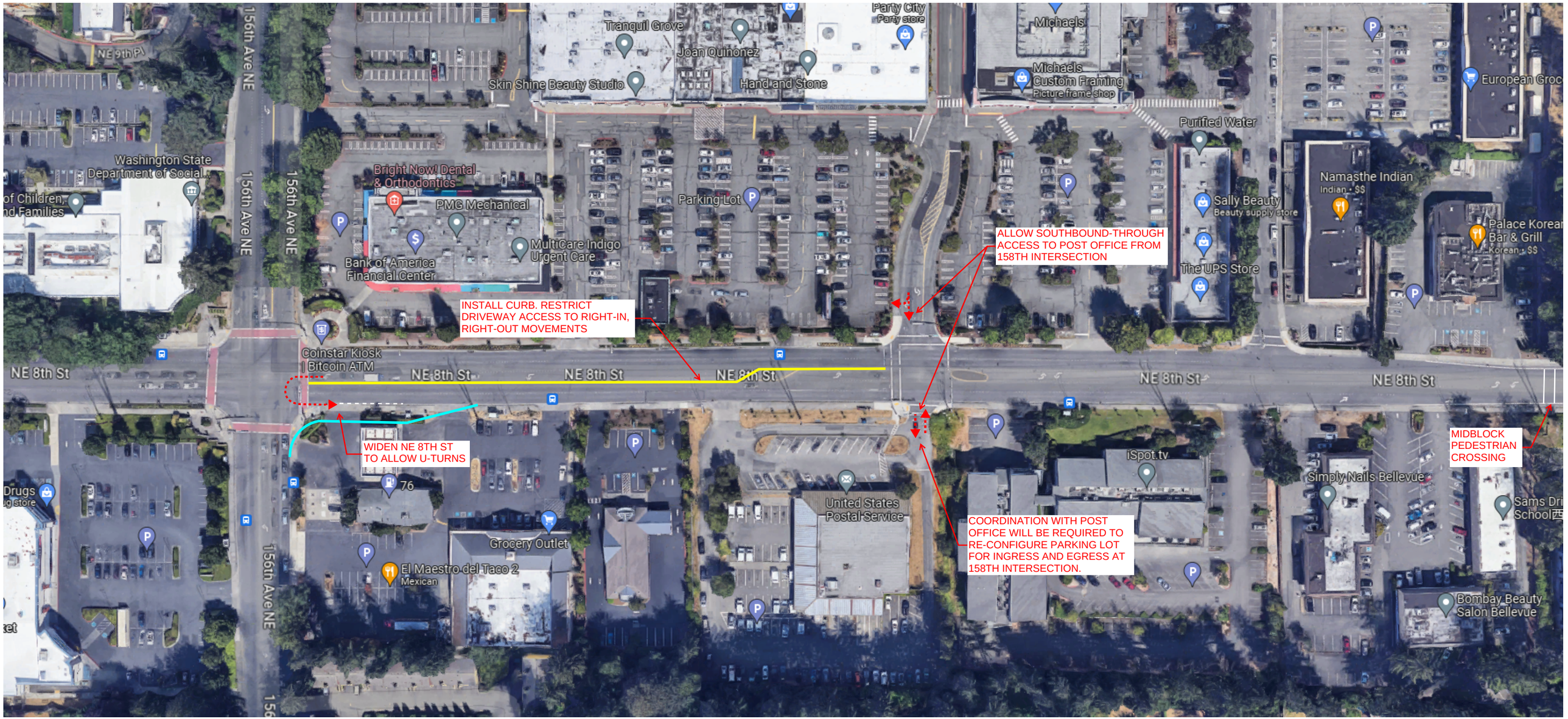


EXHIBIT DRAWING
FOR INFORMATIONAL PURPOSES ONLY

NTS

PERTEET
801 2ND AVENUE E, SUITE 302
SEATTLE, WA 98104
206.436.0515 | 800.615.9900

NE 8TH STREET STUDY

OPTION 1

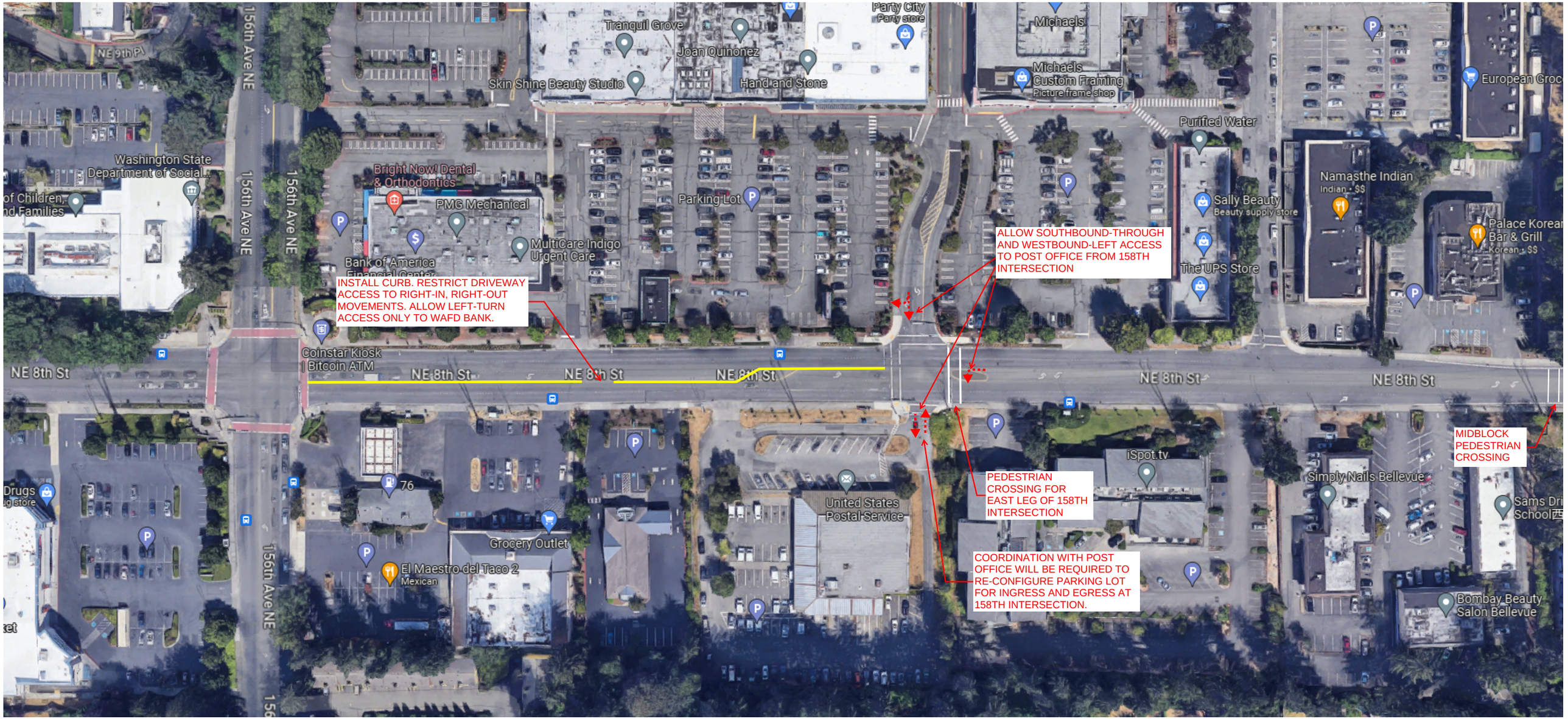


EXHIBIT DRAWING
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PERTEET
801 2ND AVENUE E, SUITE 302
SEATTLE, WA 98104
206.436.0515 | 800.615.9900

NE 8TH STREET STUDY

OPTION 2

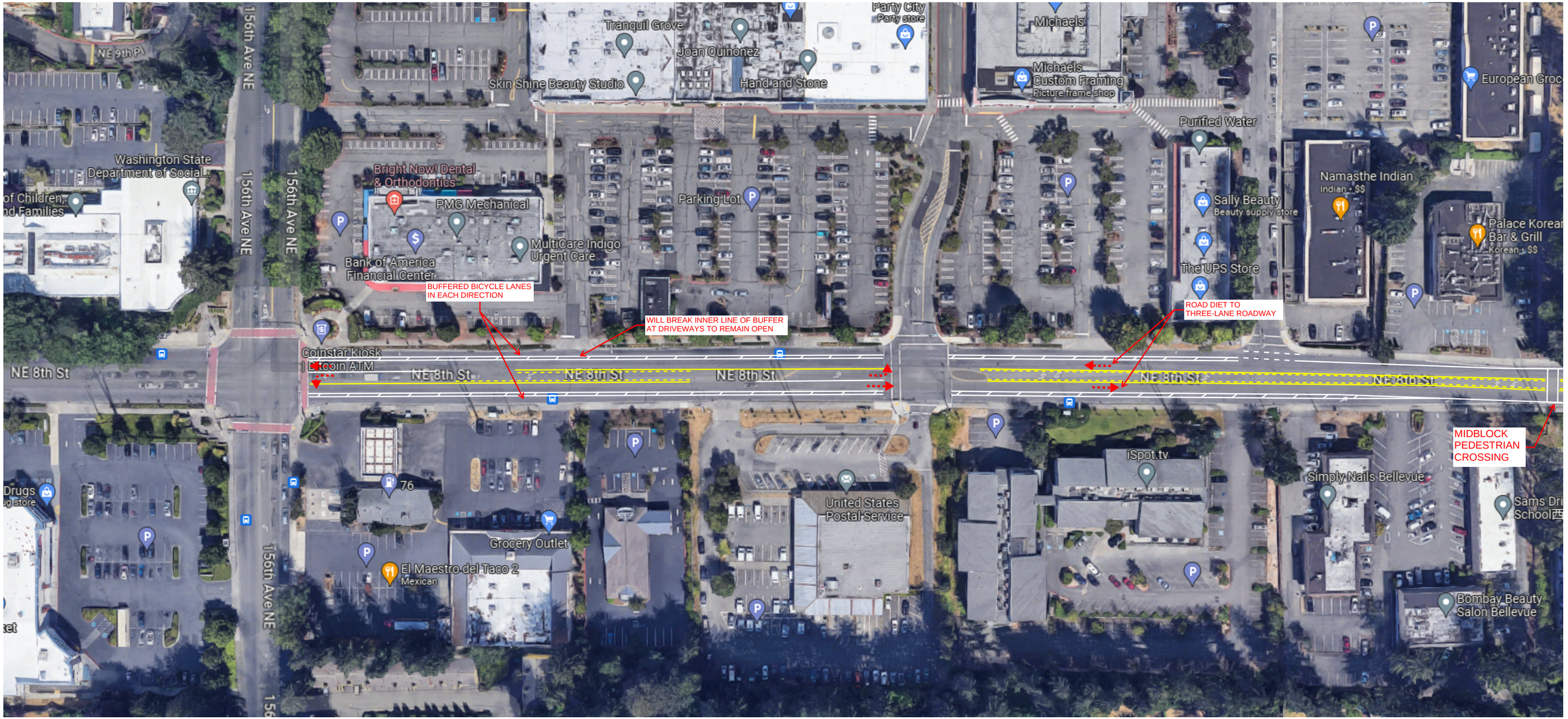

EXHIBIT DRAWING
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PERTEET
801 2ND AVENUE E, SUITE 302
SEATTLE, WA 98104
206.436.0515 | 800.615.9900

NE 8TH STREET STUDY

OPTION 3

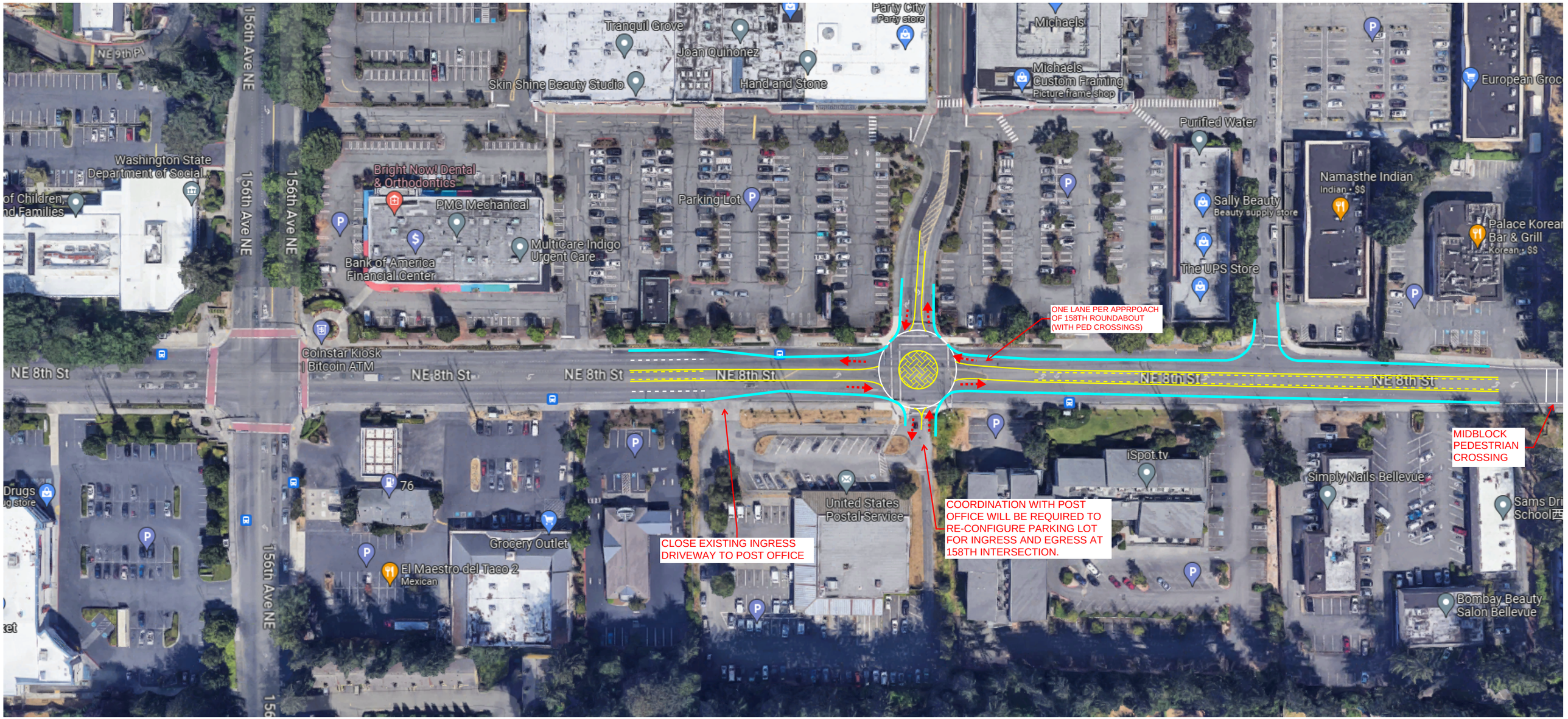

EXHIBIT DRAWING
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NTS

PERTEET
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NE 8TH STREET STUDY

OPTION 4

SHEET 4 OF 4

APPENDIX F

Design Alternative 2023 SimTraffic Modeling Reports

Option 1 Traffic Volumes

Intersection / Time of Day	SBR	SBT	SBL	WBR	WBT	WBL	WBL U-Turn	NBR	NBT	NBL	EBR	EBT	EBL	SB HV	WB HV	EB HV	NB HV
156th Avenue NE / NE 8th St																	
AM Peak Hour	134	194	53	42	291	43	19	74	362	90	57	194	96	6%	4%	4%	2%
PM Peak Hour	219	631	154	125	404	206	14	132	363	76	127	457	249	2%	1%	1%	1%
Post Office Ingress / NE 8th St																	
AM Peak Hour	0	0	0	0	381	0	0	0	0	0	40	301	0	0%	5%	3%	0%
PM Peak Hour	0	0	0	0	710	0	0	0	0	0	65	705	0	0%	1%	0%	0%
158th Avenue NE / NE 8th St																	
AM Peak Hour	24	2	34	59	337	0	0	8	7	20	0	236	66	2%	3%	3%	0%
PM Peak Hour	192	21	129	81	477	0	0	32	20	41	1	480	223	0%	1%	1%	0%
160th Avenue NE / NE 8th St																	
AM Peak Hour	18	0	3	13	360	3	0	0	0	2	17	204	39	10%	2%	3%	50%
PM Peak Hour	113	0	59	38	402	0	0	11	0	19	1	543	89	0%	1%	1%	0%

Option 2 Traffic Volumes

Intersection / Time of Day	SBR	SBT	SBL	WBR	WBT	WBL	WBL U-Turn	NBR	NBT	NBL	EBR	EBT	EBL	SB HV	WB HV	EB HV	NB HV
156th Avenue NE / NE 8th St																	
AM Peak Hour	134	190	53	42	295	47	0	74	362	90	57	194	96	6%	4%	4%	2%
PM Peak Hour	219	623	154	125	404	214	0	132	363	76	127	457	249	2%	1%	1%	1%
Post Office Ingress / NE 8th St																	
AM Peak Hour	0	0	0	0	383	0	0	0	0	0	25	293	0	0%	5%	3%	0%
PM Peak Hour	0	0	0	0	710	0	0	0	0	0	55	697	0	0%	1%	0%	0%
158th Avenue NE / NE 8th St																	
AM Peak Hour	26	1	34	59	337	16	0	8	7	20	0	236	58	2%	3%	3%	0%
PM Peak Hour	192	3	129	81	477	28	0	32	20	41	1	480	215	0%	1%	1%	0%
160th Avenue NE / NE 8th St																	
AM Peak Hour	18	0	3	13	360	3	0	0	0	2	17	204	39	10%	2%	3%	50%
PM Peak Hour	113	0	59	38	402	0	0	11	0	19	1	543	89	0%	1%	1%	0%

Option 3 Traffic Volumes

Intersection / Time of Day	SBR	SBT	SBL	WBR	WBT	WBL	WBL U-Turn	NBR	NBT	NBL	EBR	EBT	EBL	SB HV	WB HV	EB HV	NB HV
156th Avenue NE / NE 8th St																	
AM Peak Hour	134	190	53	42	295	47	0	74	362	90	57	194	96	6%	4%	4%	2%
PM Peak Hour	219	623	154	125	404	214	0	132	363	76	127	457	249	2%	1%	1%	1%
Post Office Ingress / NE 8th St																	
AM Peak Hour	0	0	0	0	368	17	0	0	0	0	25	293	0	0%	5%	3%	0%
PM Peak Hour	0	0	0	0	704	31	0	0	0	0	55	697	0	0%	1%	0%	0%
158th Avenue NE / NE 8th St																	
AM Peak Hour	26	0	34	59	337	0	0	8	7	20	0	236	58	2%	3%	3%	0%
PM Peak Hour	213	0	129	81	477	0	0	32	20	41	1	480	215	0%	1%	1%	0%
160th Avenue NE / NE 8th St																	
AM Peak Hour	18	0	3	13	360	3	0	0	0	2	17	204	39	10%	2%	3%	50%
PM Peak Hour	113	0	59	38	402	0	0	11	0	19	1	543	89	0%	1%	1%	0%

Option 4 Traffic Volumes

Intersection / Time of Day	SBR	SBT	SBL	WBR	WBT	WBL	WBL U-Turn	NBR	NBT	NBL	EBR	EBT	EBL	SB HV	WB HV	EB HV	NB HV
156th Avenue NE / NE 8th St																	
AM Peak Hour	134	190	53	42	295	47	0	74	362	90	57	194	96	6%	4%	4%	2%
PM Peak Hour	219	623	154	125	404	214	0	132	363	76	127	457	249	2%	1%	1%	1%
Post Office Ingress / NE 8th St																	
AM Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%
PM Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%
158th Avenue NE / NE 8th St																	
AM Peak Hour	26	1	34	59	337	16	0	8	7	20	25	236	58	2%	3%	3%	0%
PM Peak Hour	213	3	129	81	477	28	0	32	20	41	55	480	215	0%	1%	1%	0%
160th Avenue NE / NE 8th St																	
AM Peak Hour	18	0	3	13	360	3	0	0	0	2	17	204	39	10%	2%	3%	50%
PM Peak Hour	113	0	59	38	402	0	0	11	0	19	1	543	89	0%	1%	1%	0%

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	24.8	52.2	0.3	19
Post Office Dwy	2	2.3	13.5	0.1	25
158th	3	8.7	13.0	0.0	11
160th	4	1.7	9.8	0.1	25
Total		37.5	88.4	0.5	20

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.4	3.7	0.1	60
158th	3	18.7	26.2	0.1	10
Post Office Dwy	2	1.7	6.5	0.0	22
156th	1	29.9	39.8	0.1	8
Total		50.7	76.3	0.3	12

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.7	0.4
Total Del/Veh (s)	21.3	27.1	18.6	13.9	20.0

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.7	1.6	1.6

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	9.5	16.9	17.0	13.2	13.9

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1		0.1	0.1
Total Del/Veh (s)	1.8	0.4		3.7	1.1

Total Zone Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	319.2

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	85	92	82	61	137	128	93	128	139	53	125	53
Average Queue (ft)	47	62	43	36	96	91	53	82	95	30	86	24
95th Queue (ft)	97	110	91	74	155	142	105	145	160	61	140	65
Link Distance (ft)		1404	1404		417	417		303	303		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			500			100			415		
Storage Blk Time (%)							1	5				0
Queuing Penalty (veh)							1	4				0

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	57
Average Queue (ft)	35
95th Queue (ft)	66
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Post Office Dwy & NE 8th

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: 158th & NE 8th

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	TR
Maximum Queue (ft)	61	90	47	138	110	32	24	50	29
Average Queue (ft)	34	53	19	99	71	10	8	27	10
95th Queue (ft)	72	100	54	151	126	36	30	59	33
Link Distance (ft)		162	162	308	308	246	246	392	392
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	60								
Storage Blk Time (%)	1	5							
Queuing Penalty (veh)	2	3							

Intersection: 4: 160th & NE 8th

Movement	EB	WB	WB	NB	SB
Directions Served	L	LT	TR	LTR	LTR
Maximum Queue (ft)	29	3	2	15	38
Average Queue (ft)	11	1	0	3	16
95th Queue (ft)	35	10	6	21	45
Link Distance (ft)				72	274
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	60				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 11

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	Max	Max	Max	Max	Max	Max	Max	Max
Avg. Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
g/C Ratio	NA	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100	100	100	100
Cycles with Peds (%)	0	33	0	17	0	29	0	17

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBTL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	13	0	14	29

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	40.2	65.4	0.3	15
Post Office Dwy	2	7.5	18.6	0.1	18
158th	3	13.0	17.6	0.0	8
160th	4	3.3	11.5	0.1	22
Total		63.9	113.1	0.5	15

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.7	4.0	0.1	57
158th	3	20.1	27.6	0.1	9
Post Office Dwy	2	1.8	6.8	0.0	21
156th	1	35.4	44.2	0.1	7
Total		57.9	82.5	0.3	11

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.0	1.2	0.4
Total Del/Veh (s)	44.9	38.4	23.1	18.6	31.6

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.1	1.4	3.9

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.2	0.1
Total Del/Veh (s)	16.5	18.9	11.2	13.2	16.4

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.8	0.2	0.1
Total Del/Veh (s)	3.2	0.6	8.1	10.6	3.5

Total Zone Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	372.6

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	UL	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	279	269	235	184	204	224	91	140	163	115	242	219
Average Queue (ft)	208	197	153	144	152	180	49	95	116	72	169	143
95th Queue (ft)	331	293	253	246	214	246	103	168	179	140	263	235
Link Distance (ft)		1404	1404		417	417		303	303		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			500			100			415		
Storage Blk Time (%)							0	10				6
Queuing Penalty (veh)							0	8				13

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	130
Average Queue (ft)	66
95th Queue (ft)	154
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 2: Post Office Dwy & NE 8th

Movement	EB	EB
Directions Served	T	TR
Maximum Queue (ft)	171	70
Average Queue (ft)	76	18
95th Queue (ft)	193	97
Link Distance (ft)	417	417
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 158th & NE 8th

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	L	TR	L	TR
Maximum Queue (ft)	84	181	149	165	139	46	47	93	94
Average Queue (ft)	80	152	84	119	100	25	26	63	56
95th Queue (ft)	96	214	179	181	154	54	58	112	104
Link Distance (ft)		162	162	308	308	246	246	392	392
Upstream Blk Time (%)		10	0						
Queuing Penalty (veh)		34	2						
Storage Bay Dist (ft)	60								
Storage Blk Time (%)	23	18							
Queuing Penalty (veh)	56	40							

Intersection: 4: 160th & NE 8th

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	T	LT	TR	LTR	LTR
Maximum Queue (ft)	40	5	3	3	33	81
Average Queue (ft)	21	1	1	1	18	60
95th Queue (ft)	52	14	8	11	44	96
Link Distance (ft)		308			72	274
Upstream Blk Time (%)					1	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	60					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	1	0				

Zone Summary

Zone wide Queuing Penalty: 153

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	5.0	44.0	8.0	43.0	8.0	41.0	13.0	38.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	None	C-Min	None	None	None	C-Min	None	None
Avg. Green (s)	17.2	58.1	19.0	28.5	8.7	48.5	12.1	31.5
g/C Ratio	-0.01	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	67	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	33	100	100	0	50	100	60	20
Cycles with Peds (%)	0	50	0	40	0	50	0	40

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBTL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	13	0	14	29

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	22.4	50.3	0.3	20
Post Office Dwy	2	2.3	13.6	0.1	24
158th	3	9.8	14.3	0.0	10
160th	4	1.6	9.8	0.1	26
Total		36.1	88.0	0.5	20

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.5	3.9	0.1	59
158th	3	18.7	26.2	0.1	10
Post Office Dwy	2	1.7	6.6	0.0	21
156th	1	28.2	38.3	0.1	9
Total		49.2	75.0	0.3	13

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.9	0.4
Total Del/Veh (s)	19.5	26.3	17.2	12.3	18.6

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.6	1.6	1.6

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	10.6	17.9	13.1	14.0	14.7

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2		0.1	0.1
Total Del/Veh (s)	1.7	0.5		3.7	1.1

Total Zone Performance

Denied Del/Veh (s)	0.9
Total Del/Veh (s)	358.8

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	85	91	88	50	131	154	100	138	138	69	112	56
Average Queue (ft)	46	58	43	32	89	99	51	80	93	36	69	30
95th Queue (ft)	93	103	91	70	141	167	113	142	145	81	122	69
Link Distance (ft)		1404	1404		417	417		303	303		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			500			100			415		
Storage Blk Time (%)							1	5				
Queuing Penalty (veh)							1	5				

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	68
Average Queue (ft)	41
95th Queue (ft)	77
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Post Office Dwy & NE 8th

Movement	EB	WB
Directions Served	T	T
Maximum Queue (ft)	3	5
Average Queue (ft)	1	1
95th Queue (ft)	8	14
Link Distance (ft)	417	162
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 158th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	79	120	77	30	150	113	33	23	40	27
Average Queue (ft)	41	69	29	11	93	74	12	8	20	13
95th Queue (ft)	89	140	91	35	155	132	40	29	52	38
Link Distance (ft)		162	162	308	308	308	240	240	386	386
Upstream Blk Time (%)		1								
Queuing Penalty (veh)		1								
Storage Bay Dist (ft)	60									
Storage Blk Time (%)	1	8								
Queuing Penalty (veh)	1	5								

Intersection: 4: 160th & NE 8th

Movement	EB	WB	WB	NB	SB
Directions Served	L	LT	TR	LTR	LTR
Maximum Queue (ft)	25	6	5	14	36
Average Queue (ft)	7	1	1	3	21
95th Queue (ft)	28	11	9	22	48
Link Distance (ft)				71	262
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	60				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 13

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	Max	Max	Max	Max	Max	Max	Max	Max
Avg. Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
g/C Ratio	NA	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100	100	100	100
Cycles with Peds (%)	0	33	0	17	0	29	0	17

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBTL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	13	0	14	29

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	38.8	64.2	0.3	16
Post Office Dwy	2	7.7	18.6	0.1	18
158th	3	12.8	17.3	0.0	8
160th	4	3.1	11.3	0.1	22
Total		62.3	111.3	0.5	16

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.8	4.3	0.1	55
158th	3	19.9	27.2	0.1	9
Post Office Dwy	2	1.8	6.8	0.0	21
156th	1	40.8	50.2	0.1	7
Total		63.3	88.4	0.3	11

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.2	0.4
Total Del/Veh (s)	41.9	39.4	23.0	17.9	30.5

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.9	1.4	3.8

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.1
Total Del/Veh (s)	15.8	19.4	14.6	11.6	16.2

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.3	0.1	0.2	0.1
Total Del/Veh (s)	3.0	0.7	8.7	8.8	3.1

Total Zone Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	356.6

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	237	230	204	161	213	237	97	174	184	98	235	206
Average Queue (ft)	178	172	145	119	156	184	56	105	129	69	167	134
95th Queue (ft)	315	247	229	189	246	275	116	183	200	115	261	235
Link Distance (ft)		1404	1404		417	417		303	303		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			500			100			415		
Storage Blk Time (%)							3	9				4
Queuing Penalty (veh)							6	7				9

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	128
Average Queue (ft)	63
95th Queue (ft)	151
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

Intersection: 2: Post Office Dwy & NE 8th

Movement	EB	EB	WB
Directions Served	T	TR	T
Maximum Queue (ft)	148	66	3
Average Queue (ft)	68	17	1
95th Queue (ft)	179	86	7
Link Distance (ft)	417	417	162
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 158th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	84	186	153	39	159	143	44	43	88	77
Average Queue (ft)	79	152	70	22	114	101	23	26	61	44
95th Queue (ft)	98	217	168	48	175	162	53	53	105	82
Link Distance (ft)		162	162	308	308	308	240	240	386	386
Upstream Blk Time (%)		10	1							
Queuing Penalty (veh)		35	2							
Storage Bay Dist (ft)	60									
Storage Blk Time (%)	21	20								
Queuing Penalty (veh)	50	43								

Intersection: 4: 160th & NE 8th

Movement	EB	EB	WB	NB	SB
Directions Served	L	T	TR	LTR	LTR
Maximum Queue (ft)	38	3	6	30	67
Average Queue (ft)	21	1	1	17	48
95th Queue (ft)	50	7	11	40	75
Link Distance (ft)		308		71	262
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	60				
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Zone Summary

Zone wide Queuing Penalty: 153

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	5.0	44.0	8.0	43.0	8.0	41.0	13.0	38.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	None	C-Min	None	None	None	C-Min	None	None
Avg. Green (s)	25.6	60.7	17.7	32.9	8.6	55.8	13.4	37.2
g/C Ratio	-0.01	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	67	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	33	100	100	0	75	100	50	25
Cycles with Peds (%)	0	50	0	50	0	75	0	50

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBTL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	13	0	14	43

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	24.9	51.8	0.3	19
Post Office Dwy	2	3.6	14.7	0.1	22
158th	3	9.4	14.1	0.0	10
160th	4	2.4	10.5	0.1	24
Total		40.4	91.0	0.5	19

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.7	4.2	0.1	56
158th	3	23.6	31.2	0.1	8
Post Office Dwy	2	2.5	7.4	0.0	19
156th	1	34.6	44.6	0.1	7
Total		61.4	87.5	0.3	11

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	1.9	0.4
Total Del/Veh (s)	23.3	32.3	19.1	11.4	21.2

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.4	2.5	2.5

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.1	0.1	0.1
Total Del/Veh (s)	11.5	22.6	13.0	13.0	17.3

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.3		0.1	0.2
Total Del/Veh (s)	2.5	0.6	3.2	3.6	1.5

10% reduction with vehicle storage in TWLT

Total Zone Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	310.9

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	84	84	88	100	230	78	126	145	51	97	47	69
Average Queue (ft)	50	45	51	47	177	42	85	106	32	65	21	41
95th Queue (ft)	101	87	98	125	269	91	134	155	64	109	59	78
Link Distance (ft)		1404	1404		417		305	305		691	691	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			100		100			415			150
Storage Blk Time (%)				0	37	0	3					
Queuing Penalty (veh)				0	18	0	2					

Intersection: 2: Post Office Dwy & NE 8th

Movement	WB
Directions Served	LT
Maximum Queue (ft)	67
Average Queue (ft)	19
95th Queue (ft)	84
Link Distance (ft)	162
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: 158th & NE 8th

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	TR	L	R
Maximum Queue (ft)	62	103	224	38	34	37	33
Average Queue (ft)	34	63	161	16	15	18	13
95th Queue (ft)	73	126	248	47	44	48	40
Link Distance (ft)		162	311	258	258	404	404
Upstream Blk Time (%)		0					
Queuing Penalty (veh)		1					
Storage Bay Dist (ft)	60						
Storage Blk Time (%)	2	8					
Queuing Penalty (veh)	6	5					

Intersection: 4: 160th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	51	3	12	29
Average Queue (ft)	15	1	3	14
95th Queue (ft)	69	8	21	39
Link Distance (ft)	311		89	292
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 32

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	Max	Max	Max	Max	Max	Max	Max	Max
Avg. Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
g/C Ratio	NA	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100	100	100	100
Cycles with Peds (%)	0	33	0	17	0	29	0	17

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	13	0	14	14

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	55.3	79.9	0.3	13
Post Office Dwy	2	14.0	24.7	0.1	13
158th	3	14.5	19.3	0.0	7
160th	4	3.7	11.9	0.1	21
Total		87.5	135.8	0.5	13

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	14.9	32.6	0.1	12
158th	3	59.2	72.8	0.1	4
Post Office Dwy	2	10.8	15.6	0.0	9
156th	1	63.3	75.1	0.1	5
Total		148.2	196.1	0.3	5

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	5.4	0.0	1.1	1.5
Total Del/Veh (s)	55.7	67.6	28.5	21.8	42.2

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	13.8	12.1	13.1

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	5.9	0.1	0.2	1.9
Total Del/Veh (s)	19.0	58.4	31.2	18.1	31.4

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	14.7	10.7	7.5	6.2
Total Del/Veh (s)	3.7	15.3	34.0 87.3	28.3 75.7	18.5

63% reduction with vehicle storage in TWLT

61% reduction with vehicle storage in TWLT

Total Zone Performance

Denied Del/Veh (s)	7.2
Total Del/Veh (s)	413.5

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	TR	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	269	240	267	125	428	104	182	201	129	244	217	163
Average Queue (ft)	187	179	205	119	391	62	109	138	81	179	148	82
95th Queue (ft)	338	345	365	144	477	125	190	211	147	278	245	173
Link Distance (ft)		1404	1404		417		305	305		691	691	
Upstream Blk Time (%)					20							
Queuing Penalty (veh)					142							
Storage Bay Dist (ft)	450			100		100			415			150
Storage Blk Time (%)		1		30	59	1	11				4	0
Queuing Penalty (veh)		2		160	125	2	8				9	0

Intersection: 2: Post Office Dwy & NE 8th

Movement	EB	WB
Directions Served	TR	LT
Maximum Queue (ft)	251	173
Average Queue (ft)	154	121
95th Queue (ft)	370	219
Link Distance (ft)	417	162
Upstream Blk Time (%)	0	12
Queuing Penalty (veh)	2	88
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 158th & NE 8th

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	TR	L	TR	L	R
Maximum Queue (ft)	84	178	317	59	36	91	131
Average Queue (ft)	79	162	284	30	22	60	84
95th Queue (ft)	95	204	373	82	46	110	150
Link Distance (ft)		162	311	258	258	404	404
Upstream Blk Time (%)		17	28				
Queuing Penalty (veh)		121	152				
Storage Bay Dist (ft)	60						
Storage Blk Time (%)	26	26					
Queuing Penalty (veh)	127	55					

Intersection: 4: 160th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	TR	LTR	LTR
Maximum Queue (ft)	114	109	49	208
Average Queue (ft)	51	71	25	125
95th Queue (ft)	162	182	68	282
Link Distance (ft)	311		89	292
Upstream Blk Time (%)			6	12
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 994

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	5.0	44.0	8.0	43.0	8.0	41.0	13.0	38.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	None	C-Min	None	None	None	C-Min	None	None
Avg. Green (s)	9.9	55.3	13.4	46.9	9.1	45.5	12.5	50.8
g/C Ratio	-0.01	NA	NA	NA	NA	NA	-0.01	NA
Cycles Skipped (%)	50	0	0	0	0	0	25	0
Cycles @ Minimum (%)	0	0	0	0	0	0	25	0
Cycles Maxed Out (%)	50	100	100	75	100	100	25	100
Cycles with Peds (%)	0	50	0	25	0	50	0	50

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBL
Maximum Green (s)	9.0	26.0	30.5	40.0	30.5
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	9.0	26.0	30.5	40.0	30.5
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	25	0	14	29

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	24.9	52.1	0.3	19
158th	3	7.7	22.8	0.1	21
160th	4	1.6	10.3	0.1	24
Total		34.2	85.2	0.5	20

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.7	4.2	0.1	56
158th	3	4.5	12.0	0.1	21
156th	1	25.5	40.8	0.1	12
Total		30.7	57.0	0.3	17

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.8	0.4
Total Del/Veh (s)	22.3	24.2	16.8	12.6	18.7

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	6.1	4.4	3.8	4.1	5.0

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.3		0.1	0.2
Total Del/Veh (s)	1.8	0.7	2.0	4.4	1.3

Total Zone Performance

Denied Del/Veh (s)	0.9
Total Del/Veh (s)	314.2

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	78	72	88	69	133	127	70	112	126	48	96	63
Average Queue (ft)	49	45	55	32	94	82	39	75	95	32	69	27
95th Queue (ft)	92	80	101	86	153	146	82	127	140	60	109	77
Link Distance (ft)		1404	1404		607	607		305	305		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			100			100			415		
Storage Blk Time (%)					10		1	2				
Queuing Penalty (veh)					5		1	2				

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	58
Average Queue (ft)	34
95th Queue (ft)	70
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: 158th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	47	57	17	22
Average Queue (ft)	19	28	6	6
95th Queue (ft)	59	65	25	29
Link Distance (ft)	607	296	241	384
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: 160th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	34	11	15	39
Average Queue (ft)	13	3	3	17
95th Queue (ft)	46	19	21	47
Link Distance (ft)	296		89	292
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 7

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	Max	Max	Max	Max	Max	Max	Max	Max
Avg. Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
g/C Ratio	NA	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100	100	100	100
Cycles with Peds (%)	0	17	0	17	0	29	0	0

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	54.1	78.7	0.3	13
158th	3	17.3	31.5	0.1	15
160th	4	3.3	12.1	0.1	21
Total		74.7	122.4	0.5	14

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.9	4.5	0.1	53
158th	3	9.6	17.0	0.1	15
156th	1	39.3	52.9	0.1	9
Total		49.8	74.4	0.3	13

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.2	0.4
Total Del/Veh (s)	49.6	45.5	26.0	20.2	35.6

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.3	0.1
Total Del/Veh (s)	18.4	9.8	4.8	6.6	12.6

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.3	0.1	0.2	0.2
Total Del/Veh (s)	3.9	0.9	12.3	13.3	4.3

Total Zone Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	368.3

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	219	233	260	124	293	272	93	162	187	122	228	202
Average Queue (ft)	146	185	206	114	217	200	51	93	126	77	168	137
95th Queue (ft)	254	277	306	151	347	309	104	168	210	142	242	228
Link Distance (ft)		1404	1404		607	607		305	305		679	679
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	450			100			100			415		
Storage Blk Time (%)				37	26		0	5				4
Queuing Penalty (veh)				74	56		0	4				9

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	138
Average Queue (ft)	62
95th Queue (ft)	153
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: 158th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	275	155	34	77
Average Queue (ft)	174	93	18	52
95th Queue (ft)	327	189	45	87
Link Distance (ft)	607	296	241	384
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: 160th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	TR	LTR	LTR
Maximum Queue (ft)	70	16	38	76
Average Queue (ft)	34	4	22	53
95th Queue (ft)	81	29	50	94
Link Distance (ft)	296		89	292
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 143

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	5.0	44.0	8.0	43.0	8.0	41.0	13.0	38.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	None	C-Min	None	None	None	C-Min	None	None
Avg. Green (s)	11.3	53.2	23.7	28.9	7.8	47.2	13.3	37.3
g/C Ratio	-0.01	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	50	0	0	0	0	0	0	0
Cycles @ Minimum (%)	25	0	0	0	0	0	0	0
Cycles Maxed Out (%)	50	100	100	0	75	100	50	80
Cycles with Peds (%)	0	50	0	20	0	50	0	60

Controller Summary
Average Cycle Length (s): NA
Number of Complete Cycles : 0

APPENDIX G

Recommended Design Alternative 2035 SimTraffic Modeling Reports

Revised Option 3 (Preferred Design Altnernative) Traffic Volumes

Intersection / Time of Day	SBR	SBT	SBL	WBR	WBT	WBL	WBL U-Turn	NBR	NBT	NBL	EBR	EBT	EBL	SB HV	WB HV	EB HV	NB HV
156th Avenue NE / NE 8th St																	
AM Peak Hour	140	173	60	41	375	50	0	85	456	94	56	222	127	6%	4%	4%	2%
PM Peak Hour	351	605	149	115	423	214	0	181	435	111	91	519	261	2%	1%	1%	1%
Post Office Ingress / NE 8th St																	
AM Peak Hour	0	0	0	0	430	1	0	0	0	0	22	351	0	0%	5%	3%	0%
PM Peak Hour	0	0	0	0	713	3	0	0	0	0	68	764	0	0%	1%	0%	0%
158th Avenue NE / NE 8th St																	
AM Peak Hour	27	1	40	48	394	10	0	13	9	22	0	276	69	2%	3%	3%	0%
PM Peak Hour	217	3	136	94	478	23	0	38	24	37	2	499	273	0%	1%	1%	0%
160th Avenue NE / NE 8th St																	
AM Peak Hour	19	0	4	11	405	3	0	0	0	3	15	248	46	10%	2%	3%	50%
PM Peak Hour	114	0	68	38	418	0	0	13	0	15	2	579	106	0%	1%	1%	0%

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	23.6	51.4	0.3	20
Post Office Dwy	2	3.4	14.0	0.1	24
158th	3	6.3	10.8	0.0	13
160th	4	2.2	10.3	0.1	24
Total		35.5	86.5	0.5	20

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	0.7	4.3	0.1	56
158th	3	15.7	23.6	0.1	11
Post Office Dwy	2	1.3	6.2	0.0	23
156th	1	29.3	39.1	0.1	8
Total		47.0	73.1	0.3	13

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	2.0	0.4
Total Del/Veh (s)	22.6	28.4	18.8	12.1	20.6

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	2.4	1.2	1.7

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.1	0.1	0.0
Total Del/Veh (s)	7.8	14.9	12.4	15.8	12.2

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.4	0.1	0.1	0.2
Total Del/Veh (s)	2.2	0.7	3.2	7.4	1.5

Total Zone Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	289.5

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	89	73	96	88	166	166	88	144	172	63	98	54
Average Queue (ft)	56	50	57	39	118	118	49	96	110	35	64	23
95th Queue (ft)	107	84	104	105	185	183	102	167	188	72	107	65
Link Distance (ft)		1404	1404		417	417		305	305		679	679
Upstream Blk Time (%)									0			
Queuing Penalty (veh)									0			
Storage Bay Dist (ft)	450			100			100			415		
Storage Blk Time (%)					18		1	5				
Queuing Penalty (veh)					9		1	5				

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	61
Average Queue (ft)	38
95th Queue (ft)	68
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Post Office Dwy & NE 8th

Movement	EB	WB
Directions Served	TR	LT
Maximum Queue (ft)	3	7
Average Queue (ft)	1	1
95th Queue (ft)	8	17
Link Distance (ft)	417	162
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 158th & NE 8th

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	60	126	14	233	34	30	46	38
Average Queue (ft)	38	72	4	155	16	12	26	13
95th Queue (ft)	77	139	23	259	41	35	57	41
Link Distance (ft)		162	311	311	258	258	391	391
Upstream Blk Time (%)		0		0				
Queuing Penalty (veh)		2		0				
Storage Bay Dist (ft)	60							
Storage Blk Time (%)	1	6						
Queuing Penalty (veh)	3	4						

Intersection: 4: 160th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	48	6	22	29
Average Queue (ft)	17	1	5	11
95th Queue (ft)	59	14	29	34
Link Distance (ft)	311		89	280
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 24

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	Max	Max	Max	Max	Max	Max	Max	Max
Avg. Green (s)	7.0	31.0	9.0	23.0	7.0	31.0	7.0	25.0
g/C Ratio	NA	NA	NA	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100	100	100	100
Cycles with Peds (%)	0	17	0	17	0	29	0	17

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBTL
Maximum Green (s)	5.0	38.4	22.1	48.4	22.1
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	5.0	38.4	22.1	48.4	22.1
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	100	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	0	0	17	14

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Arterial Level of Service: EB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
156th	1	60.7	85.9	0.3	12
Post Office Dwy	2	9.4	20.4	0.1	16
158th	3	10.2	15.0	0.0	10
160th	4	3.4	11.7	0.1	21
Total		83.8	133.1	0.5	13

Arterial Level of Service: WB NE 8th

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
160th	4	1.3	4.8	0.1	49
158th	3	23.4	31.4	0.1	8
Post Office Dwy	2	1.7	6.6	0.0	21
156th	1	37.5	46.4	0.1	7
Total		63.8	89.3	0.3	11

1: 156th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	1.4	0.5
Total Del/Veh (s)	55.5	42.9	28.2	22.2	36.9

2: Post Office Dwy & NE 8th Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	7.9	1.3	4.9

3: 158th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.8	0.1	0.2	0.5
Total Del/Veh (s)	14.7	22.9	16.1	14.7	17.5

4: 160th & NE 8th Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.4	0.1	0.2	0.2
Total Del/Veh (s)	3.3	1.2	8.2	19.0	4.9

Total Zone Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	360.0

Intersection: 1: 156th & NE 8th

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	T
Maximum Queue (ft)	220	264	282	125	270	263	117	192	206	113	258	243
Average Queue (ft)	160	201	219	118	200	191	81	127	152	73	192	162
95th Queue (ft)	252	310	331	141	297	279	144	228	231	135	288	262
Link Distance (ft)		1404	1404		417	417		305	305		679	679
Upstream Blk Time (%)									0			
Queuing Penalty (veh)									0			
Storage Bay Dist (ft)	450			100			100			415		
Storage Blk Time (%)				43	23		4	14				6
Queuing Penalty (veh)				90	49		9	16				21

Intersection: 1: 156th & NE 8th

Movement	SB
Directions Served	R
Maximum Queue (ft)	160
Average Queue (ft)	92
95th Queue (ft)	190
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	150
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

Intersection: 2: Post Office Dwy & NE 8th

Movement	EB	WB
Directions Served	TR	LT
Maximum Queue (ft)	195	14
Average Queue (ft)	89	3
95th Queue (ft)	243	36
Link Distance (ft)	417	162
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 158th & NE 8th

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	84	178	34	285	45	46	108	77
Average Queue (ft)	79	153	13	212	21	31	68	52
95th Queue (ft)	97	199	40	302	52	58	121	88
Link Distance (ft)		162	311	311	258	258	391	391
Upstream Blk Time (%)		9		1				
Queuing Penalty (veh)		69		3				
Storage Bay Dist (ft)	60							
Storage Blk Time (%)	27	17						
Queuing Penalty (veh)	136	46						

Intersection: 4: 160th & NE 8th

Movement	EB	WB	NB	SB
Directions Served	LTR	TR	LTR	LTR
Maximum Queue (ft)	108	17	31	95
Average Queue (ft)	51	4	12	67
95th Queue (ft)	124	25	36	119
Link Distance (ft)	311		89	280
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 440

Intersection: 1: 156th & NE 8th

Phase	1	2	3	4	5	6	7	8
Movement(s) Served	NBL	NBSB	EBL	EBWB	SBL	NBSB	WBL	EBWB
Maximum Green (s)	5.0	44.0	8.0	43.0	8.0	41.0	13.0	38.0
Minimum Green (s)	5.0	7.0	5.0	5.0	5.0	7.0	5.0	5.0
Recall	None	C-Min	None	None	None	C-Min	None	None
Avg. Green (s)	14.4	50.7	24.7	29.1	8.4	46.0	11.4	37.3
g/C Ratio	-0.01	NA	NA	NA	-0.01	NA	NA	NA
Cycles Skipped (%)	33	0	0	0	20	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0	0	0	0
Cycles Maxed Out (%)	67	100	100	0	60	100	60	80
Cycles with Peds (%)	0	50	0	60	0	50	0	40

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

Intersection: 3: 158th & NE 8th

Phase	1	2	4	6	8
Movement(s) Served	EBL	EBWB	NBTL	EBT	SBTL
Maximum Green (s)	11.0	32.4	22.1	48.4	22.1
Minimum Green (s)	5.0	7.0	5.0	7.0	5.0
Recall	Max	Max	Max	Max	Max
Avg. Green (s)	11.0	32.4	22.1	48.4	22.1
g/C Ratio	NA	NA	NA	NA	NA
Cycles Skipped (%)	0	0	0	0	0
Cycles @ Minimum (%)	0	0	0	0	0
Cycles Maxed Out (%)	100	100	100	100	100
Cycles with Peds (%)	0	14	0	17	14

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

APPENDIX H

Crosswalk Criteria

Attachment A

Transportation Department

Practices and Priority Guidance for Allocation of Crosswalk Related Resources

Department Practice:

The City of Bellevue's Transportation Department has developed practices and guidance for the consideration of marking crosswalks and for the allocation of enhanced crosswalk treatments at uncontrolled marked crosswalk locations. Where uncontrolled marked crosswalks are warranted based upon the conditions in the Manual on Uniform Traffic Control Devices (MUTCD), Engineering Judgment, and department practices, resources may be allocated to further support and enhance safety at a crossing location. However, with limited resources, priorities must be established to help guide the allocation of those limited resources. Additionally, improvements may be implemented in a staged manner, at the discretion of the Transportation Department, to better utilize available resources. Treatments such as advance signing, raised medians, curb bulbs, improved lighting, radar-speed feedback signs, and raised profile crosswalks are but a few options which may be implemented prior to consideration of flashing crosswalk systems or other more intensive resource demands. The practice described herein is intended to assist in developing priorities for the allocation of resources for pedestrian crossings.

Scoring Criteria and Priorities:

Scoring criteria were developed to reflect the relative merit for improvements at a pedestrian crossing. In some cases, dependent on conditions, it may be sufficient to have only pavement markings and signing for one crossing while another crossing merits more extensive resources. The criteria includes influences from schools, vehicle traffic, vehicle speeds, pedestrian activity and other considerations which play a role in the merit for additional improvements at a crossing location.

A location which satisfies a particular criteria is not justification in itself for alterations and no duty is implied or presumed for the city to provide a marked crosswalk or enhanced crosswalk treatment by use of this guidance. It should be recognized there are limited resources for managing the transportation system for all users and accordingly priorities for implementing new features or adjusting existing ones must be balanced with the needs citywide and assessed periodically by the City.

In consideration of limited resources, a minimum score of 20 must generally be achieved by the sum of criteria. However, there may be certain limited exceptions to a lower threshold if found by the Transportation Department to be in the interest of the overall prioritization process; for instance, coupling a candidate site with another nearby location as part of a CIP or Levy Program project. This minimum score of 20 may be adjusted up or down in the future by the Transportation Department to reflect changes in resources and priorities. Once this threshold is satisfied, the subject site will be considered a candidate for improvements together with other locations which also exceed this score threshold. The Transportation Department will then evaluate more subjective conditions such as community support, availability of funds relative to cost of improvement, engineering judgment of the site's safety, crosswalk study findings, or other considerations as deemed appropriate by the Transportation Department.

SCORING CRITERIA

A. Elementary School 5, Middle School 4, High School 3 (max score 5); 0 **Score.**
B. Travel lanes – 2 score for each through travel lane, 1 score for center turn lanes or median areas, 2 score where bike lanes and/or parking exist (max score value 10); 5 **Score**.
C. Posted Speed Limit – 5 score for 35 mph or higher, 4 for 30 mph, 3 for 25 mph, 2 for 20 mph established school zone. The 85th percentile speed data may be used in lieu of posted speed at discretion of the engineer; 4 **Score.**
D. ADT – Average Weekday Daily traffic below 10,000 vehicles is 0, 10,000 to 15,000 is 3 and above 15,000 is 5; 5 **Score.** Assuming total intersection volume of 160th Ave NE and NE 8th St is 8% of average weekday daily traffic.
E. Collision History (pedestrian/bike) – one non-motorized collision within crossing location in past 3 years = 5. More than one pedestrian/bike collision within past 3 years or a single fatality is score of 10 if determined to be clearly located within the crossing limits as determined by the engineer; 0 **Score.**
F. Collision History (vehicle) – 2 score for 5 or more rear end collision (or other relatable collision not included in E. above) in past 3 years associated with activity from the crossing as determined by the engineer**;** 0 **Score.**
G. Traffic Signal or existing marked crosswalk located within 500 feet of subject review location – deduct 5 score. Where traffic signals are within 300 feet of the crossing outside of the downtown district, flashing crosswalk systems will not be considered. Within the downtown district, this criteria may be overridden at the engineer's discretion**;** 0 **Score.**
H. Crossing is located on a designated arterial – Major is 5, Minor is 3, Collector is 2; Local Street is 0; 3 **Score.**
I. Coordination. Project can be coordinated with another Capital Improvement Project, Grant Opportunity, Levy Project, Development, or Overlay project for efficiency in design and construction and reduced resource demand is 5; 5 **Score.** NE 8th Street Study
J. Pedestrian volume of 20 peds or higher in peak one hour period is 5 score. Where 20 peds is not achieved for a crossing assign 0 score; 0 **Score.** No data for this location.
K. Site Conditions. This category allows the professional to assign up to 10 points for site conditions which are unusual, such as a side trail connection, or roadway gradient, or other aspect that in the opinion of the professional elevate the subject crossing beyond typical consideration; 0 **Score.**
L. Implementation Complexity. If the site meets criteria for installation or enhancement, satisfies certain community goals, and can be implemented relatively simply with minimal costs, staff time, or other resources as determined by the Department, assign a 5 score; 0 **Score.** Scoring dependent on City staff.

The City retains the right to remove or modify any enhanced treatment or marked crosswalk within the public right-of-way at its sole discretion and may from time to time develop pilot projects to evaluate new technologies and advances in crosswalk safety. The above criteria is developed by the Transportation Department staff and any interpretation of criteria or conditions rests with the Department Director or their designee.

SUBJECT LOCATION: 200 ft east of 160th Avenue NE and NE 8th Street
TOTAL SCORING: 22

Prepared by: Rebecca O'Sullivan, EIT Date: 9/22/2023